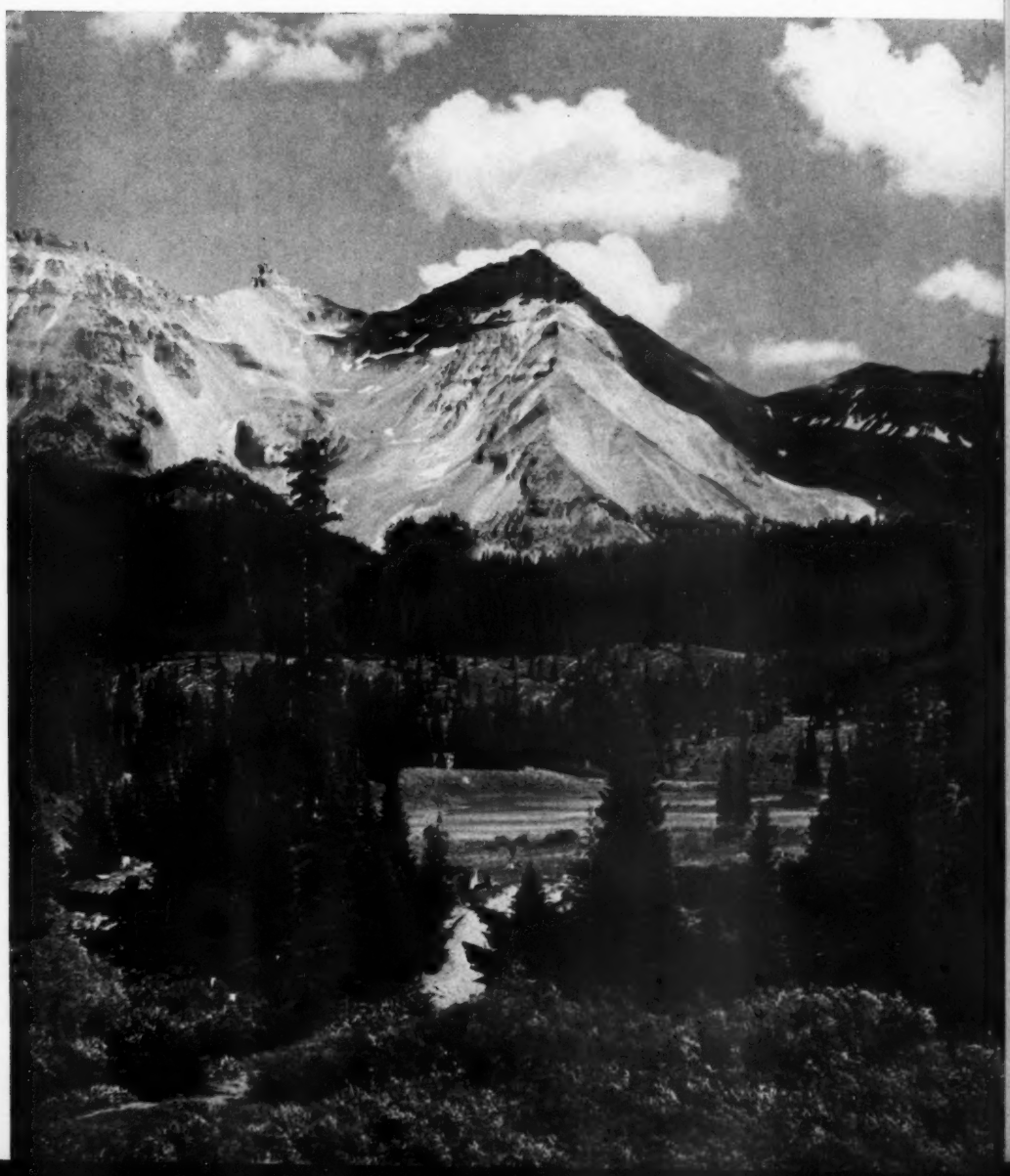
MINING CONGRESS JOURNAL

APRIL 1943



A JOURNAL for the ENTIRE MINING INDUSTRY

•

Published by the AMERICAN MINING CONGRESS

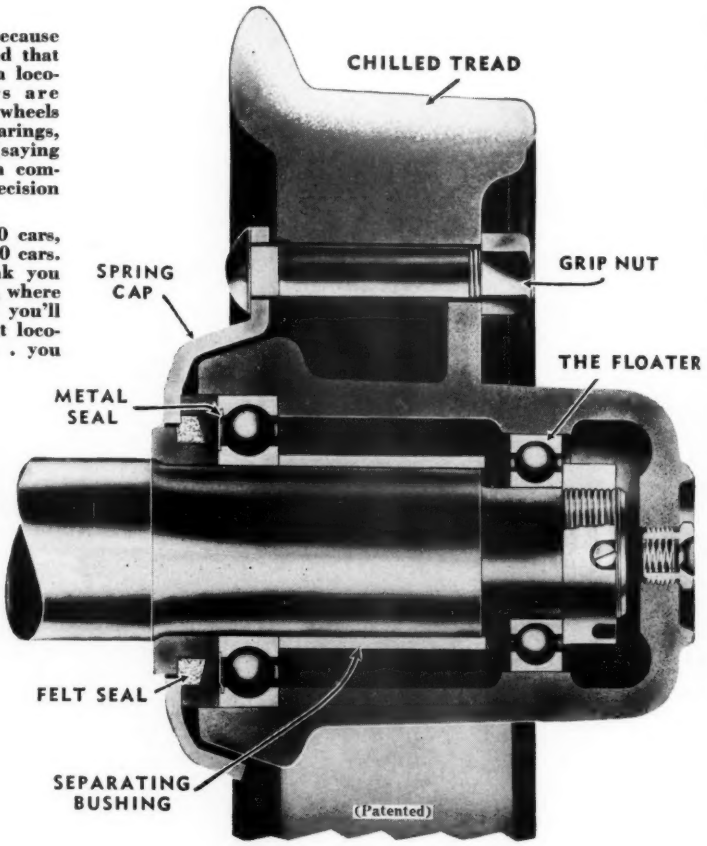
Need Another Locomotive QUICK?

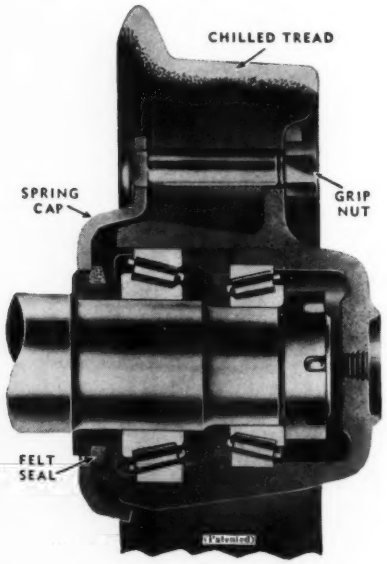
Here is one way to get it and probably the quickest at the least cost! Replace the wheels on your cars with S-D "Floater" Ball Bearing Wheels and TWO of your locomotives will do the work of THREE.

★ Don't question the above suggestion, because Independent Engineers' Tests have proved that you can increase the pulling capacity of a locomotive almost 50 per cent when cars are equipped with S-D "Floaters" as compared with wheels equipped with other types of fine precision bearings, and with no increase in power consumption (saying nothing about the much greater advantage when compared with obsolete wheels having plain or non-precision bearings).

For example, if your maximum trip is now 20 cars, install "Floaters" and your locomotive will pull 30 cars. If you are using two locomotives and you think you need another one quickly to get three 20 car trips, where you are now getting two, install "Floaters" and you'll get the increase in 30 car trips with your present locomotives. You save a hard-to-get locomotive . . . you save manpower.

IN ADDITION . . . "Floaters" are guaranteed in writing against breakage or bearing failure for 5 years. Furthermore, if you have to grease them more than once in five years, we pay the extra cost. You need these remarkable wheels for increased production, for saving time, money and manpower.





THE S-D TIMKEN BEARING EQUIPPED WHEEL

Like "Floaters," this new wheel has the closed hub, is quickly and easily demountable, and when demounted, bearings remain in perfect original adjustment on axle. The castings are the same scientifically designed and built castings as those for our "Floater" wheels and produced under our patented annealing process.

REPLACEMENT WHEELS. Our replacement wheel division will give special attention to your orders for Repair Wheels.

Sanford-Day Iron Works, KNOXVILLE, TENNESSEE

MINING CONGRESS JOURNAL

VOLUME 29, NUMBER 4

Contents

FOR APRIL 1943

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NETHERLAND PLAZA HOTEL

CINCINNATI, OHIO

Preliminary Program on Page 37

FRONT COVER—*"Springtime in the Rockies"*—Photo by T. J. Barbre, Denver

Editorials:
Stockpiling is No Myth 17
Victory Call for Scrap 17
Coal Mine War Conference 17

A Growing Zinc Supply from Pioche, Nev. 18
By R. L. DEAN

Good Records for Safety First Achieved at Combined Metals 23
By DEWEY T. SULLIVAN

A Modern Mill Treats the Combined Metals Ore 24
By JOSEPH B. BLOW

Some Hints on Maintenance and Conservation Frequently Overlooked 26

Iron Ore Output in Utah Increasing 31

How an Eight-Mile Conveyor Belt System Reduced Delays In Coal Haulage 33
By EARL J. JONES

Coal Mine War Conference 36

Converting a Gold Mining Enterprise for the War Program 38
By MERRILL E. SHOUP

Short-Cut Method of Determining Induction Motor Horsepower from Ammeter Readings 41
By JOSEPH A. SETTER

Coal Division Reports 43
Mine Roof Sealing to Prevent Slate Falls

Wheels of Government 47

Cracking Hard Rock on "The Hill" 49

Personals 51

News and Views 53

Manufacturers' Forum 67

Opinions expressed by authors within these pages are their own, and do not necessarily represent those of the American Mining Congress.

★

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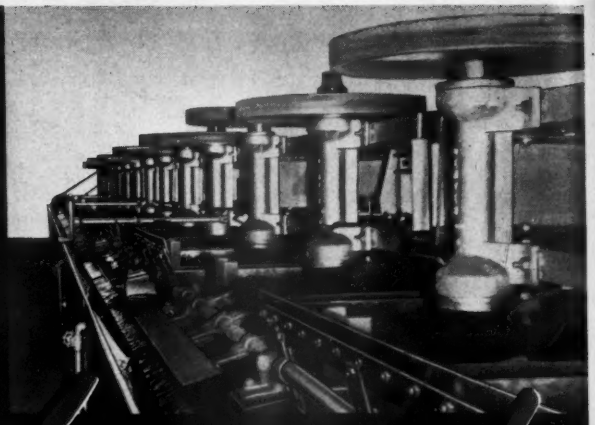
INCREASE CRITICAL MINERAL PRODUCTION WITH *Supercharged* DENVER FLOTATION



What is meant by *Supercharged* Denver Flotation?

MAXIMUM FLOTATION RESULTS are dependent upon a number of factors . . . one of which is *aeration.* In a Denver Flotation Cell, aeration has been accomplished by *suction of air down the standpipe.* Air under pressure . . . from two to six pounds . . . has never been advocated as it only produces large bubbles acting as air lifts which are detrimental to the production of a high grade concentrate and a low tailing.

After many years of experimentation, Denver Equipment Company introduces *Supercharged* flotation . . . *Supercharged* flotation is exactly what the name implies . . . air is *atomized* into the pulp at from two to eight *ounces.* Field results in many large plants have proved that where additional air is desired, the following benefits are obtainable:

1. *Reduced reagent costs* because of finely aerated pulp.

2. *Simplified cell control* due to greater froth depth.

3. *Lower power* consumption because of super-aerated and diffused pulp.

4. *Improved metallurgical results;* lower tailing, higher recovery and equal or better grade of concentrate.

Many ores do not require *Supercharged* flotation but it is often impossible to determine when it will be beneficial . . . so all Denver "Sub-A" Flotation Cells are now built so they can be *Supercharged.*

Ask us more about *Supercharged* flotation and how it may increase your production of critical minerals.

Do You Have Receded Disk Wearing Parts with Air Diffusers in Your Denver Flotation Cells?

DENVER EQUIPMENT 24 HOUR SERVICE COMPANY

NEW YORK CITY, NEW YORK: 50 Church St.
CHICAGO: Suite 1005, 69 W. Washington St.
SALT LAKE CITY, UTAH: 727 McIntyre Bldg.
TORONTO, ONTARIO: 45 Richmond St. W.
MEXICO, D.F.: Edificio Jalisco, Calle Ejido No. 7
MIDDLESEX, ENG.: 493A, Northolt Rd. S. Harrow
RICHMOND, AUSTRALIA: 530 Victoria Street
JOHANNESBURG, S. AFRICA: 8 Village Road

STANDARD—RELIABLE 24 HOUR SERVICE EFFICIENT

DENVER EQUIPMENT COMPANY, 1400 17th St., Denver, Colorado

A Quick Way to Better Loading

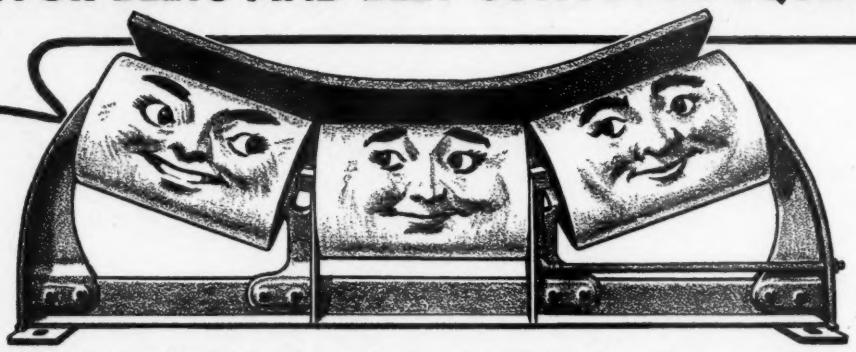
GOODMAN 460 LOADER

Operating Advantages

- high capacity loading, even on sharp curves and in close posting
- loading head digs tight coal at any desirable height
- machine handles easily while loading or tramming; hydraulic control, hydraulic brakes
- all working parts adequately protected from dirt
- rugged construction for continuous service and low maintenance cost

GOODMAN MANUFACTURING COMPANY • HALSTED STREET AT 48TH • CHICAGO, ILLINOIS

BROTHER, BE WISE—PROLONG THE LIFE OF CONVEYOR BELTS AND BELT CONVEYOR EQUIPMENT!



If "we" could only talk—here's what we'd say: "Operators, please give us extra special care to make us last longer. This is mighty important during wartime, because materials used in belt conveyor equipment are needed for guns, tanks, planes and other war equipment. Be wise—be patriotic—follow this advice—it will pay extra dividends in trouble-free operation."

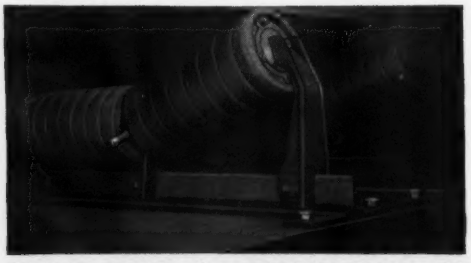
1

KEEP INSTALLATION CLEAN. Cleanliness plays an important part in prolonging the life of your belt conveyor equipment. Make a daily inspection to see that there is no accumulation of material that has spilled off the belt. If material is not removed it will cause the belt to drag over it as well as around the head, tail, snub and other pulleys. Consideration should also be given to cleaning the belt. The material being handled determines the type of cleaning device.

2

TRAIN THE BELT AND MAINTAIN THE TRAINING WITH SELF-ALIGNING IDLERS. It is important that both the carrying and return runs of a conveyor belt be kept practically central with its supporting idlers. This can be accomplished by properly "training" the belt on the conveyor . . maintaining that training is assured through the use of self-aligning idlers and return rolls. Link-Belt manufactures a complete line of self-aligning idlers to meet every need.

3



USE IMPACT IDLERS AT LOADING AND TRANSFER POINTS. When tons of ore, rock, coal and other materials slap a belt on the back, proper protection must be given at the loading point. The use of Link-Belt Rubber-Tread Impact Idlers definitely prolongs belt life by preventing cutting and bruising of belt . . cushioning even the heaviest blows . . thus greatly increasing belt life and protecting the belt, idler bearings and framework. Link-Belt engineers will be glad to make recommendations.

4

MAINTAIN PROPER BELT TENSION AND LUBRICATION. Eliminate excessive belt sag between idler rolls—Proper tension relieves the belt of much unnecessary wear . . Never over-lubricate idler rolls—inspection of one idler roll will often determine at what intervals equipment should be lubricated. Too much grease is as bad as too little.

AND MAKE IT A RULE to establish regular inspection periods—and make replacements with genuine Link-Belt parts when necessary. Link-Belt manufactures a complete line of idlers, pulleys, bearings, take-ups, drives, trippers, etc.

LINK-BELT
BELT CONVEYOR EQUIPMENT

LINK-BELT COMPANY

Chicago, Indianapolis, Philadelphia, Pittsburgh, Wilkes-Barre, Huntington, W. Va., Denver, Kansas City, Mo., Cleveland, Detroit, St. Louis, Seattle, Toronto, Vancouver

9067-B

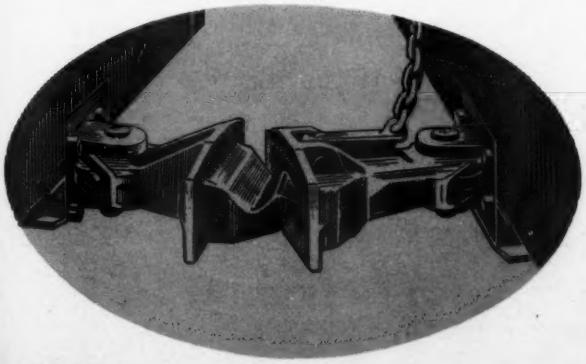
He's Lost His Chance to Bag a Jap...

Pity this poor, forlorn lump of coal. Spilled from his berth in a jolting, banging mine car, he never had a chance to go to war; never even had an opportunity to make his boss a profit. But it's not his fault! If his boss had only insisted on O-B Automatic Couplers for those new mine cars, like as not he'd already be a part of a big "block-buster" bomb — maybe winging his way to Tokyo.

Let the O-B Automatic Coupler-equipped car give your coal a "sleeper" ride. Rigid steel-beam connections keep the cars in a smooth, straight-pulling line, eliminate from 15 to 20 feet of dead slack per trip. Rubber draft gears absorb damaging jolts and strains which often rob your cars of their top layer of coal.

If you are considering the purchase of new mine cars and want to utilize them to their fullest capacity, install O-B Automatic Couplers—the only truly automatic coupler that gives you positive interlock, an unbreakable rubber draft gear and automatic self-centering. Write today for full information.

2369-AM



★ BUY WAR BONDS ★ ★ ★ ★ ★ ★

Ohio Brass

MANSFIELD, OHIO

CANADIAN OHIO BRASS CO., LTD., NIAGARA FALLS, ONT.

HERE'S UNDERGROUND POWER

In the Big Jim Coal Company mine at Blanche, Ky., this 200-kw G-E portable, d-c substation gives full voltage for most efficient operation equipment at the working face. There's no need for long runs of heavy copper. ↓

→ A close-up of sealed-ignitron units on the rectifier car of a 300-kw portable substation at Union Collieries, Renton, Pa. As a means of underground conversion these factory-sealed, all-metal units make mercury-arc rectification the most practical and the most economically maintained.

TODAY, your decisions concerning underground power depend on a new set of factors: Will a new d-c substation help bring up enough more coal to balance the critical materials that go into it? Will it save enough manpower to balance the installation work? And how soon can it be obtained?

On each of these new counts—as on the old cost-saving, loss-reducing basis—G-E portable substations with sealed-ignitron rectifiers have the odds on their side. Conversion to d-c closer to the working face saves a large amount of copper, an extremely critical material today. It keeps full voltage at the working face. With full voltage at the face you can get greater output from your mechanized equipment, which means you can bring up more coal.

The sealed-ignitron mercury-arc rectifier does the conversion job with less servicing, thus saving manpower. What maintenance there is, is easy. It's a "natural" for mine conditions, where grit and dirt are such a threat to rotating machines.

These G-E portable substations for underground mine service are supplied in ratings from 150 kw to 500 kw; 275 volts to 600 volts, d-c. At the present time we can deliver them to you in less time than it takes to deliver rotating equipment. For complete details and delivery information, call our local office. ***General Electric Company, Schenectady, New York.***

The Army-Navy "E", for Excellence in the manufacture of war equipment, now flies over six G-E plants employing 100,000 men and women.

in step with the times!

G-E Portable D-C Substations . . . with Sealed-ignitron Type Rectifiers

★**FOR GREATER OUTPUT** Complete mobility underground makes it easy to keep full d-c voltage at the face, thus getting the most out of mechanized equipment.

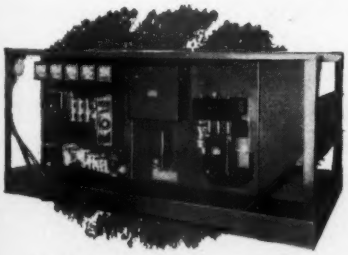
★**FOR SIMPLER MAINTENANCE** No major rotating parts to care for. The sealed-ignitron units (warranted for 3 years' service) require no pumping. No need for specially trained personnel.

★**FOR WARTIME CONSERVATION** Saves copper, lowers energy losses in d-c transmission circuits. Requires less critical material than any other type of conversion equipment.

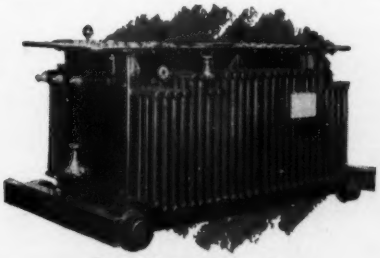
★**FOR BETTER DELIVERY** At present, delivery schedules on rectifier units are substantially shorter than on rotating equipment. In most cases, over-all costs are lower, too.

JUST "RUN IN" THREE PORTABLE UNITS AND YOUR D-C POWER IS READY

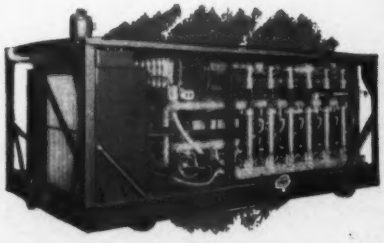
These three integrated "car units" make up a complete substation:



A-c automatic-reclosing switchgear



Pyranol transformer unit



Rectifier car with d-c reclosing switchgear

Builder of ALL TYPES of mine power-conversion units—motor generators, synchronous converters, and rectifiers

GENERAL ELECTRIC

657-16-204

Whaley "Automat" Coal Loading Machine with shoveling action, equipped with 15 Timken Bearings at the important points of friction and hard service.

Put more Timken Bearings in your mining equipment—increase its productive capacity for Victory and its economy for post-victory competition.

Whaley "Automat" discharging coal into cars by means of its parallel lift rear conveyor.

Don't be satisfied with anything but top-notch performance in the new equipment you make—performance that measures up to today's necessities and tomorrow's probabilities.

Redesign if you have to—and install Timken Tapered Roller Bearings at every suitable position to eliminate once and for all the threats of friction; radial, thrust and combined loads; and misalignment of moving parts. Then speeds will be higher, endurance greater, maintenance lower.

A few Timken Bearings are better than none in any kind of equipment, but you will not know what they can really do until you have them at every point of friction and hard service.

Equipment designers who use Timken Bearings wherever they can, produce machines that not only *perform better* but also *sell better*—because no name in bearings means so much to the buyer as "TIMKEN". The Timken Roller Bearing Company, Canton, Ohio.

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS

"All There Is In Bearings"

More tonnage of better-broken coal

HERCULES PERMISSIBLES

Even in the middle of a drive for more production, it's worth while to check up and make sure you're using the permissible that will give you the most coal in the right sizes.

Whether you want more lump or more fines; whether you're shooting for hand loading or mechanical loading; there is a Hercules Permissible that will shoot your coal the way you want it.

Our advice and assistance in selecting the permissible best suited for different veins has increased the tonnage of properly-broken coal in many mines. The table, at right, will give you a general idea of the types of Hercules Permissibles available. A word from you will bring more detailed information.

HERCULES PERMISSIBLES

	Approximate No. of 1¼" x 8" Cartridges per 100 lbs.	Cartridge Strength—Percent
For Lump Coal		
Red H* C	276	29.5
Red H* D	316	22
Red H* F	356	13.5
Hercoal* C-1	400	Less than 5%
Hercoal* D	450	About same cartridge strength as black powder
Hercoal* F-1	500	
For Rock or Fine Coal		
Red H* B	280	32
Collier C*	320	21
For Wet Work		
Hercogel* A	200	48
Hercogel* 2	240	46

* REGISTERED U. S. PATENT OFFICE

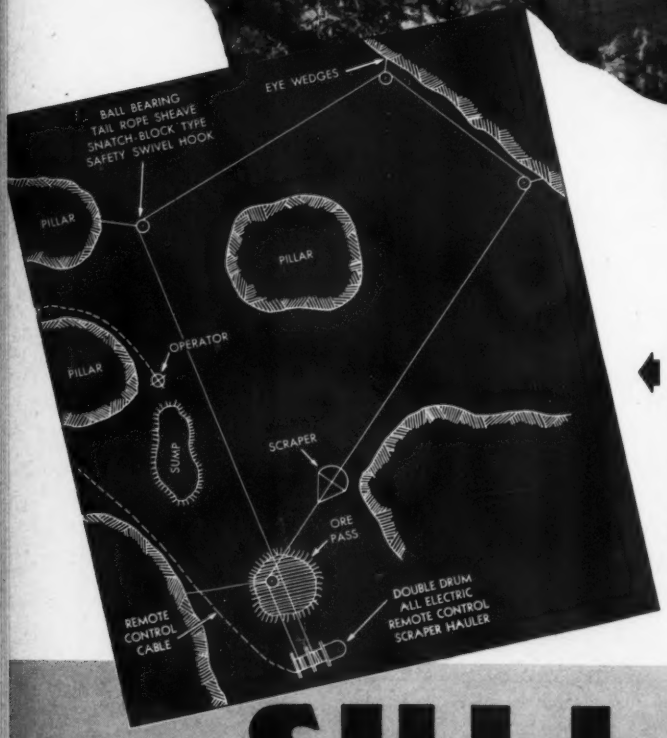
B-40

HERCULES POWDER COMPANY

INCORPORATED

934 KING STREET, WILMINGTON, DELAWARE

Now



Sullivan *all-electric* Remote Control Scraper Hauler System in operation in large Tennessee zinc mine. Also available in air-electric type.

TYPICAL MINE LAYOUT FOR SULLIVAN REMOTE CONTROL SCRAPER HAULER

Sketch at left is a plan view of hauler set-up shown in the photograph at the top of page. Pictures position of operator and scraper hauler, and sheave arrangement.

With remote pushbutton control of his scraper hauler, operator carries small pushbutton station in his hand, moves to any desired position and handles the entire operation by himself. Note: digging point cannot be seen from scraper hauler. Ordinarily this would require one man to operate hauler and another man, stationed near digging point, to signal operator. Sullivan Remote Control system assures a full scraper on every trip and provides a flexibility and efficiency in scraping never before possible in non-ferrous metal mines.

SULLIVAN

ROCK DRILLS • AIR COMPRESSORS
SCRAPER HAULERS • HOISTS • LOADERS
CORE DRILLS • CORE DRILL CONTRACTING

BIRMINGHAM · BOSTON · BUTTE · CHICAGO · DALLAS · DENVER · DULUTH · EL PASO · HUNTINGTON · KNOXVILLE · NEW YORK · PITTSBURGH · ST. LOUIS · SALT LAKE CITY · SAN FRANCISCO · SCRANTON
and in Principal Cities Throughout the World

REMOTE *PUSHBUTTON* CONTROL or ENTIRELY AUTOMATIC CONTROL

SULLIVAN is proud to announce two important developments in scraper hauler operation . . .

1. A new remote pushbutton control for scraper haulers where the operator stands at an advantageous point and controls all operations by means of a small portable pushbutton station held in one hand.

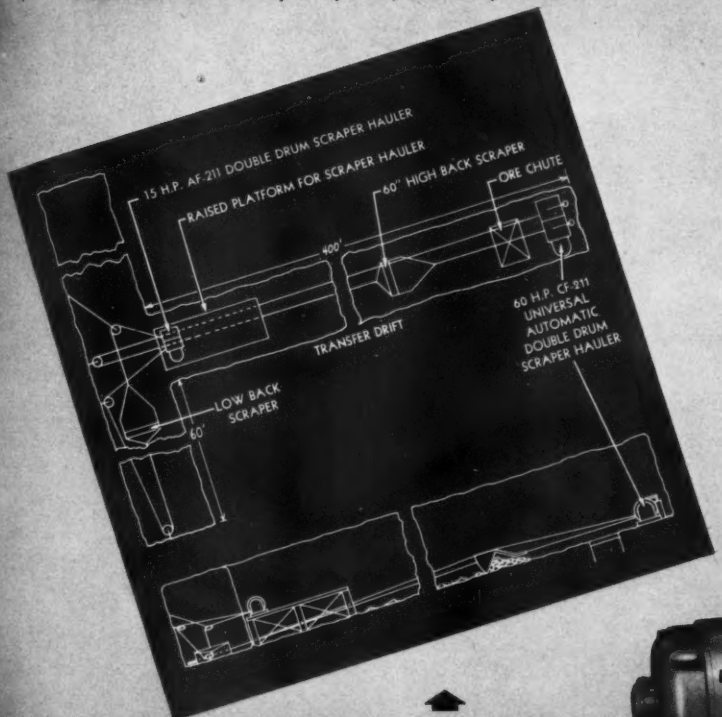
2. An entirely automatic control whereby all movements of the scraper are controlled entirely by means of limit switches.

Either of these two control systems can be applied to any new Sullivan Scraper Hauler and remote control can be installed on any Sullivan Hauler now in your mines.

They meet the needs of today's manpower shortage situation! They speed up operations! They increase production! They are practical, service-tested and proved, foolproof, dependable! Write for full information today. SULLIVAN MACHINERY COMPANY, Michigan City, Indiana; Claremont, New Hampshire. *In Canada:* Canadian Sullivan Machinery Co., Ltd., Dundas, Ontario.

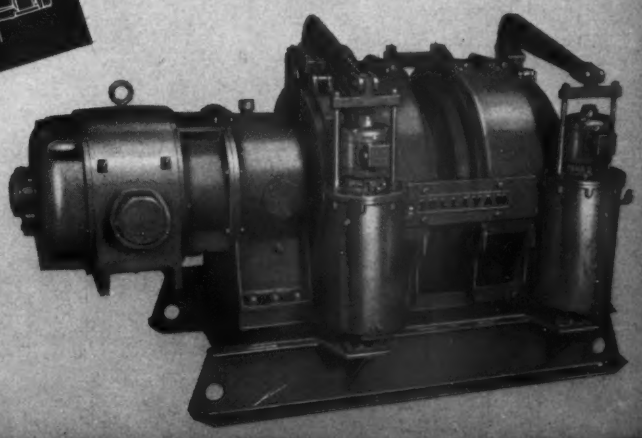
SEND FOR NEW SCRAPER HAULER CATALOG

Shows Sullivan's complete line including new models as well as new remote and automatic controls. Complete, comprehensive. Contains a wealth of scraping information . . . how to determine sizes of scrapers, sizes of rope, rope speeds . . . unusual scraping set-ups . . . facts on haulers, motors, capacities of scrapers, weights of various materials, etc., etc., etc. Available free to mine operators. Write the nearest Sullivan office for your copy . . . TODAY!



TYPICAL MINE LAYOUT FOR SULLIVAN AUTOMATIC CONTROL SCRAPER HAULER

For transfer scraping in mines where scraping set-ups are more permanent, Sullivan has developed a completely automatic hauler system that "runs by itself" and meets all safety regulations. Safety signal light systems are available. The sketch above shows a typical layout. The muck which is "fed" into the transfer drift by a small scraper, is scraped away by the completely automatic Scraper Hauler System. Installations of Sullivan Automatic Control Scraper Haulers have increased production up to 25% and have established new lows in maintenance expense. Write for further information at once.



Report to Clancy

ON THE 2900 LEVEL

This Lightweight Air Hoist takes on another "big" little job

1 This is the hoist Clancy wants down at the new level. It weighs only 250 lbs. Note size in comparison to the powder box. It can scrape 15 tons per hour a distance of 50 feet and proportionately less tonnage up to 100 feet. No wonder Clancy wants it in a hurry.

2 **On its way**—the A4NN-OJ is being lowered down a slide to the haulage level. The other hoist doing the lowering is an Ingersoll-Rand size EUA "Utility" air motor driven unit.

3 **Waiting for a car**—and a ride to the working place. Due to its small size the hoist does not obstruct the haulage way.

4 **Going up**—through the timber slide to the new 2900 level where the scraper layout will be installed.

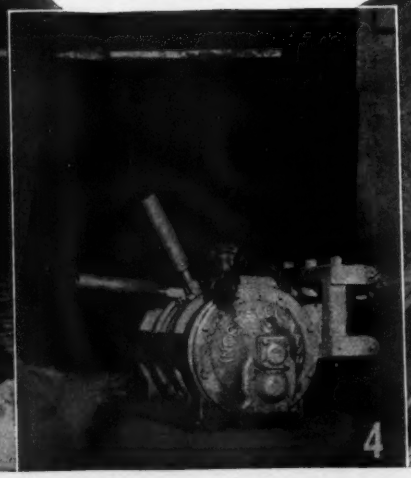
5 **On the job for Clancy**—mounted on a 3½" drill column and arm the A4NN-OJ is now ready for work. It pulls muck from the crosscut to flat raise. It is then turned in line with the raise and the scraper pushes the muck down the flat section to the top of the vertical raise.

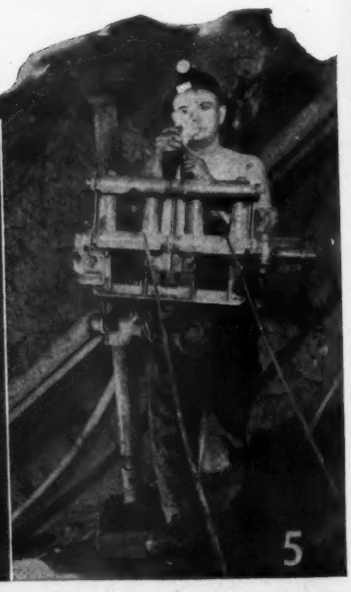
I-R Slusher hoists include a size for any kind of mucking work.

Ingersoll-Rand
11 BROADWAY, NEW YORK, N. Y.

All plants of Ingersoll-Rand Company are flying the Army-Navy "E" awarded "for high achievement in the production of war materials."

16-249





AMERICA'S WAR PRODUCTION DEPENDS ON TANKS LIKE THESE

Take a good look at these huge spherical tanks. Chances are your hose, your belts, your packings may come from them or from others just like them.

These are used for storing butadiene in the first of the synthetic plants operated by U. S. Rubber Company . . . a second will soon be in production.

Having worked in the field of synthetic rubber since 1921 we know what uses each of the five basic types of synthetic rubber is best suited for . . . Neoprene, Buna-S, Buna-N, Butyl and Thiokol . . . U. S. Rubber uses all five types . . . knows which one to select for the performance required . . . and how to compound the specific synthetic rubber for the specific task. This experience is important to you.

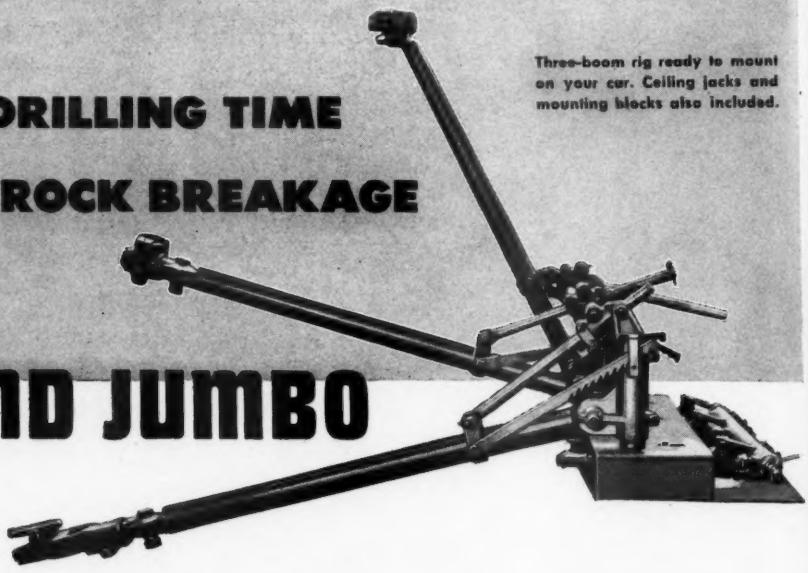
Our booklet on synthetic rubber will give you much valuable information. Send for your copy.

Mechanical Goods Division

UNITED STATES RUBBER COMPANY

ROCKEFELLER CENTER NEW YORK

50% LESS DRILLING TIME
25% MORE ROCK BREAKAGE
with the
CLEVELAND JUMBO



Three-boom rig ready to mount on your car. Ceiling jacks and mounting blocks also included.

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The Jumbo insures *real speed* in setting up and tearing down. And it saves *hard work.* Eliminates straining to lift drifters and columns. You can use larger drills and thus get greater footage. Unusual safety, too. No blocks or wedges to loosen up, no danger due to falling columns or drifters.

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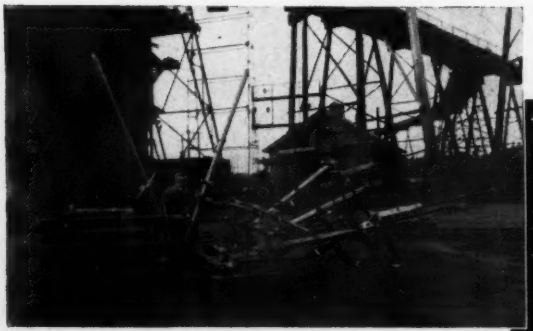
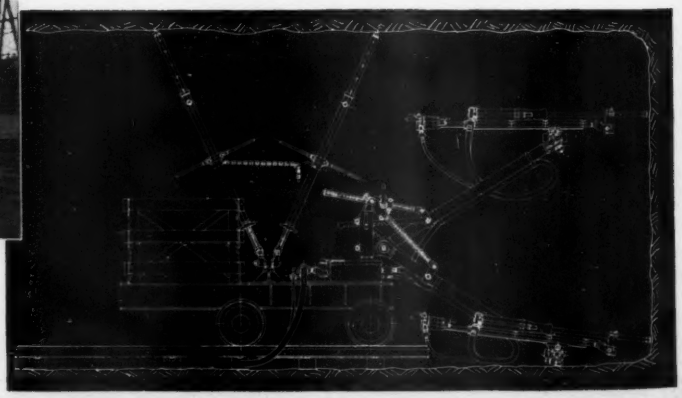
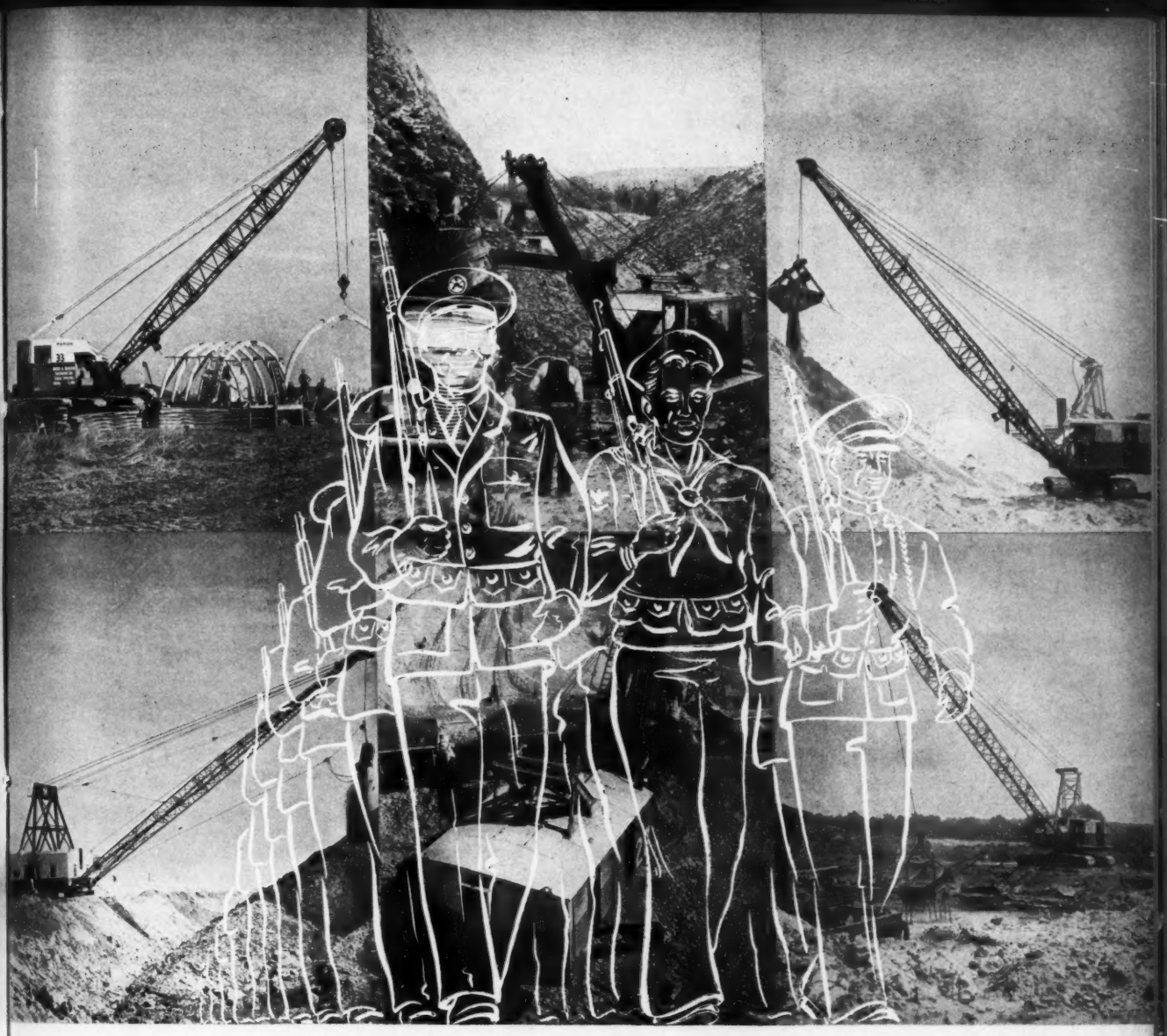


Three-boom Jumbo, with drifters, hoses and ceiling jacks ready for work. Racks at back of car carry drill steels.



Cleveland 2-boom Jumbo with our Model PD14 Drifters. Note position of ceiling jacks and lifting jacks for booms.



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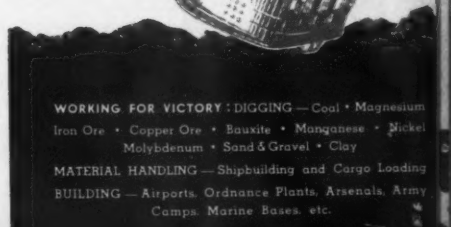

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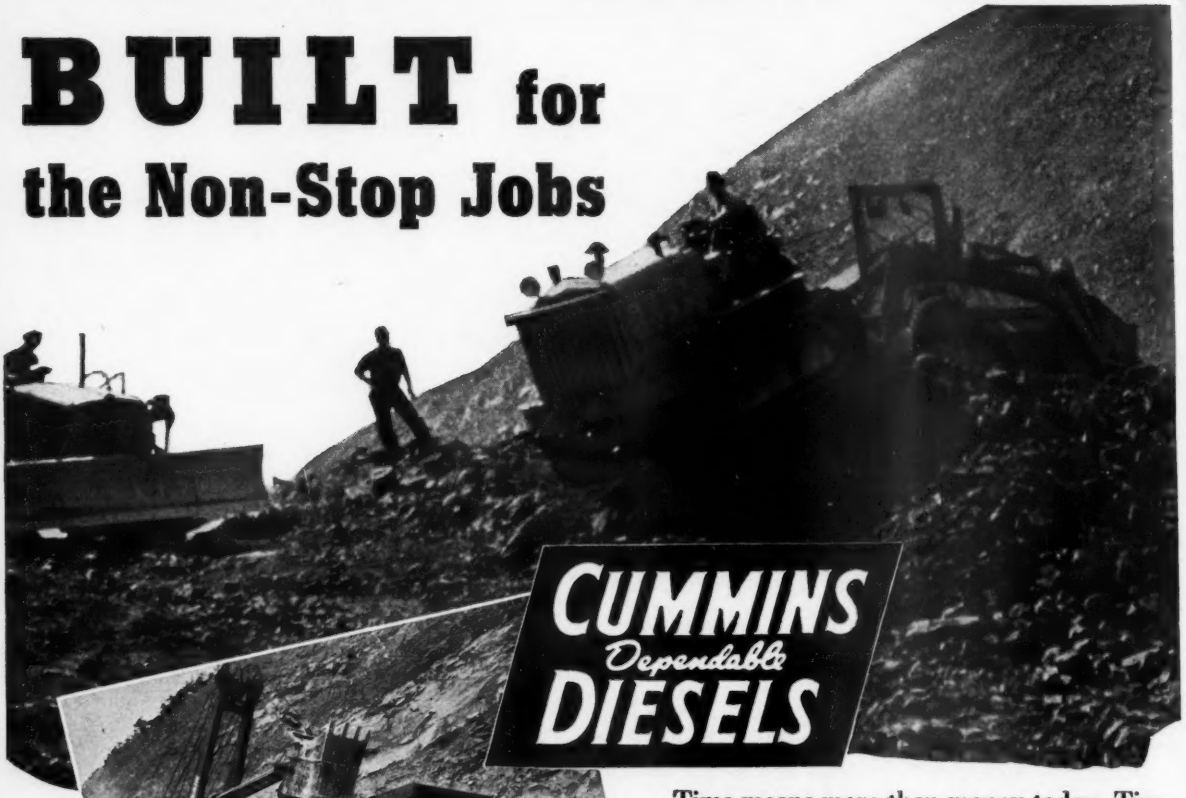

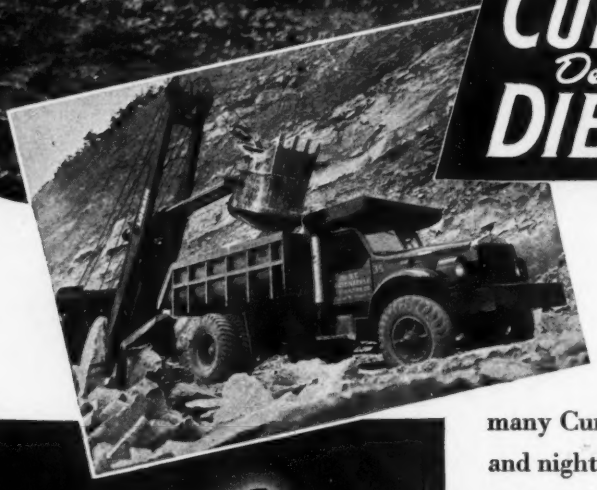

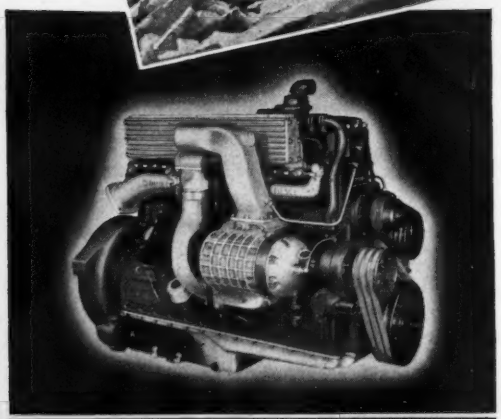

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ILLUSTRATED AT TOP: *A supercharged Cummins Dependable Diesel powers this Cletrac FDLC tractor with 23-yard Wooldridge Scraper.*

LEFT, ABOVE: *One of the fleet of Cummins Diesel-powered trucks owned by the S. T. Brotemarkle Construction Co.*

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MINING CONGRESS JOURNAL

Published for the Entire Mining Industry by The American Mining Congress

H. C. CHELLSON, Editor

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Stockpiling

AMONG the several interesting highlights at the hearings in Washington before Senator J. G. Scrugham's mining subcommittee of the Senate Special Committee on Small Business was the growing support of the mining industry's proposed plan for stockpiling strategic and critical materials as a permanent national policy.

Stockpiling is not a new idea, but today the proposal is strongly fortified by historical facts of apparent omission by our Government, as revealed in the experiences of our Nation in this war as well as the last. One needs to recall that in 1919 Bernard Baruch urged that our Government begin immediately to build up stocks of strategic and critical materials. This proposal fell on deaf ears then, and became lost in the "Back to Normalcy" epoch in spite of continued efforts down through the years for revival by some members of Congress, army and navy officials and mining's own organizations.

When the war clouds became darker in Asia and Europe, Representative Scrugham (now Senator from Nevada) succeeded in obtaining stockpiling appropriations for $3,000,000 in 1936, $3,000,000 in 1937 and only $500,000 in 1938. During the following year, in which war suddenly descended upon Europe, the Congress enacted against determined opposition the Thomas Bill, authorizing appropriations totaling $100,000,000 to be spent for stockpiling purposes. Up to June 1, 1940, appropriations of $47,500,000 thereunder had been made to purchase strategic materials; and by December 7, 1941, the stockpiling effort had become merged with the over-all program of procuring our total needs for direct war production.

We have been at war for many months and the end is unknown. We have made efforts to develop our strategic ore deposits, and private industry has advanced the metallurgy and science of strategic and critical minerals to a remarkable degree. We also have a better idea of our resources of strategic materials, and of the means by which lower-grade sources of certain vital metals and minerals may be utilized. Should this effort of stockpiling suffer the same fate as it did after the last war? WPB Chairman Donald Nelson, at one of the Small Business Committee hearings, said:

"If we find that we have surpluses over and above current needs, then we shall recommend stockpiling such surpluses against a future time of need. If we are so fortunate as to come to the end of this war with reserves still on hand and unused, then, it seems to me, arrangements should be made for permanent stockpiles to be used only in periods of future crisis, military or otherwise, according to criteria governing use to be determined by Congress itself. And very possibly, domestic producers should be encouraged to add to such stockpiles for a definitely stated period after the end of the war in order to smooth out the many readjustments of the postwar period."

The mining industry, many Government officials, the staff of the army and navy, stand united once again and strongly urge that stockpiling continue as a means of insuring national security and a vital factor in safeguarding the peace.

Victory Call for Scrap

FEEDING the Nation's war machine with all the copper it needs is a difficult task. Last year the mining industry contributed a substantial quantity of scrap to the 1,000,000 tons of copper, brass and bronze scrap collected which yielded approximately 674,200 tons of copper. That, however, was last year. Now, in 1943, the Salvage Division of the War Production Board has issued a Victory Call for more copper bearing scrap.

Mines have been hard up for copper wire and cable and have been stretching their supplies and conserving to the utmost. Our copper mines are crowding new production of the metal, in some cases far above what anyone had conceived to be possible; and several additional new sources of production are to receive WPB consideration very shortly. Yet so urgent is the war demand for still more copper that the entire mining industry—coal, metal and non-metallic—in common with industry generally, must redouble its vigilance in salvaging and making available every pound of idle copper that can contribute to the early and complete downfall of the Axis.

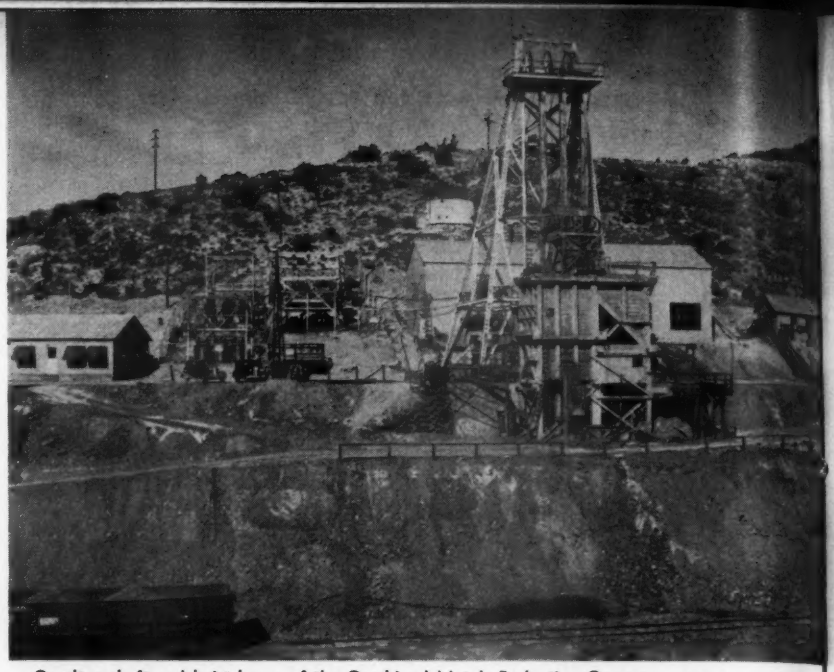
Coal Mine War Conference

THE coal mining industry and the manufacturers who serve it have studied and carried out the 1943 production blueprints for nearly four months. The industry has spit on its hands to wallop the Axis with greater production records in 1943. Though output steadily climbs higher in this important phase of Victory, coal mining still has many problems which require collective counsel by the best talent in the industry.

It is important, therefore, that coal operators should have an opportunity to confer on manpower, production, maintenance, conservation, safety and other timely subjects, both among themselves and with high-ranking war agency officials concerned with continued maximum production. This opportunity has been made possible through a Coal Mine War Conference, to be held by the American Mining Congress in Cincinnati on May 17-18.

The industry must make the most of this opportunity in this critical year of decision.

A Growing Zinc Supply From Pioche Nevada



Caselton shaft and hoist house of the Combined Metals Reduction Company, near Pioche, Nev. The building on the left is the mine office

Production of zinc-lead ore from faulted limestone replacement ore bodies is being speeded by the use of small portable slusher hoists at the properties of the Combined Metals Reduction Company, Pioche, Nev.

By R. L. DEAN
Superintendent
Combined Metals Reduction Company

MANY YEARS of patience, hard work and practical mining and geological engineering knowledge required for the development of a complicated zinc ore deposit since World War I is beginning to yield vital results in the country's program in World War II. The story describing the operations and achievements of the Combined Metals Reduction Company near Pioche, Nev., parallels those of many other of the deep wet mines in the Rocky Mountain area, where successful battles with water, complex geology and complex metallurgy during the "twenties" now make it possible for them to add materially to the nation's supply of nonferrous metals.

Not many years ago the present site of operations around the New Caselton shaft was uninhabited country, whereas today one of the most modern mills in the country stands, and zinc mining continues apace for the war program. Exploration by diamond and churn drilling is still being conducted with exacting study of the complicated geology which provides direction for mining zinc and lead ore from replacement deposits in limestone. The undrilled area remaining is very large, but geological deductions after many years of study in this district are considered highly optimistic for the future. The fortunes or misfortunes of the domestic zinc market in the post-war era will largely determine the activity which the future holds in store for this large potential zinc area.

In order to give a brief summary of history and economic geology of the district the following comments are taken from the abstract "Geology and Ore Deposits of the Pioche District, Nevada," by Lewis G. Westgate and Adolph Knopf. This study was made during the period 1922-1926.*

"The Pioche district during four years in the early seventies was second only to the Comstock district in output of silver. The bonanza ore of those stirring times came from fissure veins in the Prospect Mountain quartzite, of lower Cambrian age. In recent years the main interest has shifted to the bedded replacement deposits of silver-bearing lead-zinc sulphide ore occurring in the limestone members of the Pioche shale—a type of ore body which was discovered accidentally during the prospecting of the fissure veins.

"The ore deposits of the district comprise three groups: (1) silver-bearing fissure veins in quartzite; (2) silver-bearing limestone and dolomite. All of them appear to have been formed at about the same time, in the epoch of mineralization that occurred shortly after the intrusion of the granitic rocks and their allied dikes of granite porphyry and lamprophyre. The entire present output of the district is coming from the replacement deposits in limestone and dolomite.

"The replacement deposits include both replacement fissure veins and stratiform ('bedded') replacement deposits. The replacement fissure veins dip steeply and cut across the bedding of the carbonate rocks in which they are enclosed. They are thoroughly oxidized, as deep at least as 1,100 ft., for on none of them have the mine workings penetrated to water level, and they are highly manganiferous and limonitic and low in silica. At certain horizons stratiform replacement deposits extend out as lateral branches from the fissure veins. Deposits of this kind occur mainly in the Mendha limestone, Highland Peak limestone, and Lyndon limestone. The stratigraphic range is therefore at least 5,500 ft., and as some of the

* Geological Survey Professional Paper 171, 1932.

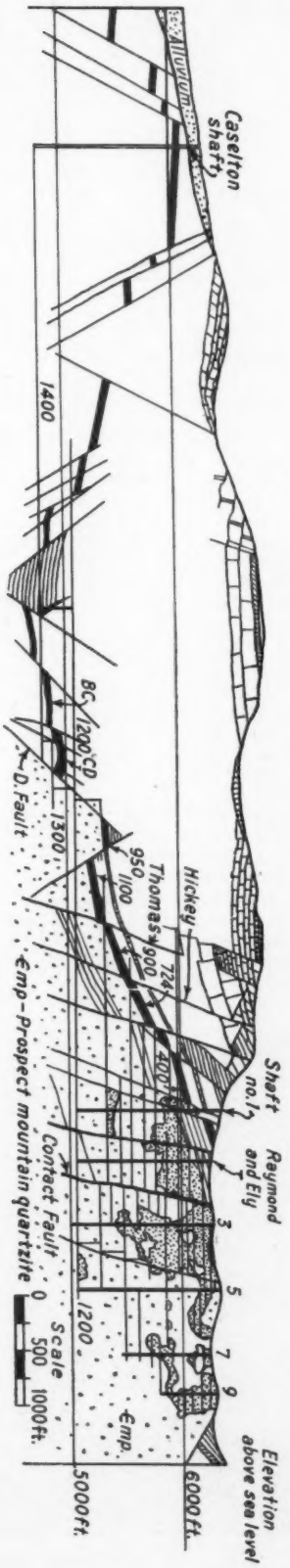
fissure veins extend down through the underlying Pioche shale the indicated range may exceed 6,500 ft. The most notable representatives of the replacement fissure veins are at the Bristol mine, where they yield silver-bearing copper-lead-zinc ores.

"The stratiform replacement deposits that are attracting most attention occur at the intersections of steep fissures with the limestone members of the Pioche shale. In recent years the 'bedded' ore of the Combined Metals mine has been of main interest. The ore is essentially an intimate intergrowth of pyrite, sphalerite, and galena. Although above water level the ore is unoxidized. It extends on both sides of the mineralizing fissure as far as 250 ft.

"At the Prince mine nearby ore beds were formed at seven successively higher horizons in the Pioche shale and the overlying Lyndon and Highland Peak limestones. The ore 'beds' above water level in the Prince mine are thoroughly oxidized and consist of manganese-iron oxides low in silver, lead, and zinc. About 800,000 tons of ore carrying 2.5 to 3 oz. of silver to the ton, 3 percent of lead, 35 percent of iron, and 15 percent of manganese has been shipped.

"Some of the stratiform ore bodies —the ore beds, as they are locally called—were formed adjacent to exceedingly insignificant-looking fissures; and this dependence on inconspicuous mineralizing fissures is beyond doubt one of the most impressive features in the geology of the district. It opens the possibility that there may be many other bedded deposits which, like the Combined Metals ore bed, do not crop out. To find these ore bodies will be difficult, but their discovery will be aided primarily in applying skillfully a knowledge of the geologic column and by determining the fault that has disturbed or changed the normal sequence of the strata."

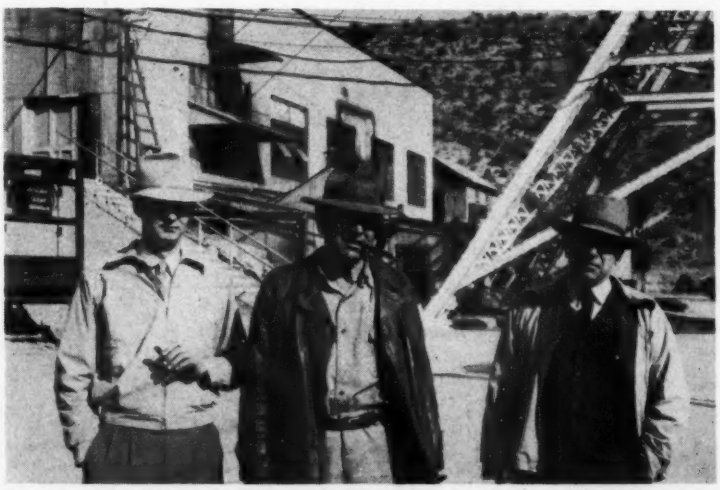
Fig. 1. A vertical projection of the important mining area in the Pioche district. Faulting adds to the complexity of the geology of the zinc-lead replacement ore bodies (in black) in the limestone



Operations of the company were first confined in the Pioche shale and Lyndon limestone not far from the contact of the quartzite. The zinc-lead ore was mined from the limestone replacement bed commonly called the CM or Combined Metals bed. All supplies and men were lowered through the No. 1 shaft and output sent to the company mill in Bauer, Utah. Production during the late twenties reached around 300 tons per day. During the depression period operations were virtually suspended but as the demand for zinc gradually increased from 1934 on operations kept pace with the upward trend of general industry.

Boulder Dam Power a Boon to the District

Preparations at the Caselton, however, was carried on during 1930. Meanwhile exploration by churn drilling and careful geological study continued, and a site was determined for the new Caselton shaft on the other side of the range nearly two miles southwest from No. 1 shaft. Power from Boulder Dam was made available in 1936, and today 66,000 volts transformed to 440 volts supply electric energy for the operations.



Left to right, Henry Swanson, metallurgist; Owen Walker, master mechanic, and R. L. Dean, superintendent

The power station is a short distance from the mill and Caselton shaft. In October, 1936, an 8 x 8 ft. tunnel or crosscut was started from the 1,400 level of the Caselton shaft to connect with the workings of the No. 1 shaft, approximately 4,800 ft. Some delays were experienced in the project due to encountering a large volume of water and quicksand. The tunnel was completed, however, and the present rate of water pumped through the Caselton shaft is about 2,100 g.p.m. The maximum was 5,000 g.p.m.

Surface Plants are Modern

The layout of the surface plants is compact, with the contours of the terrain permitting a gentle slope from the Caselton shaft to the concentrate loading station at the foot of the mill. A modern and well-lighted change room located a short distance from the shaft supplies the needs of miners with lockers, heating facilities, showers, wash basins. Directly connected to the change room is another room which is used for safety first and miners' meetings. This building is also joined directly to the general mine office, engineering headquarters and superintendent's office.

A well equipped machine shop employs about 35 men. Here a broad range of repairs, construction, wartime conservation and maintenance is under the direction of Owen Walker, master mechanic. Considerable welding and hard facing is done with Lincoln welding units, employing Stellite and Fleetweld electrodes. The company has made its own skips, and also has complete facilities for making scrapers and other general mine and mill equipment. All blacksmith work is hardfaced and machined. This practice has found to increase the life of the items by one-third, with subsequent lower costs.

Repairing a mine car wheel by welding in the machine shop

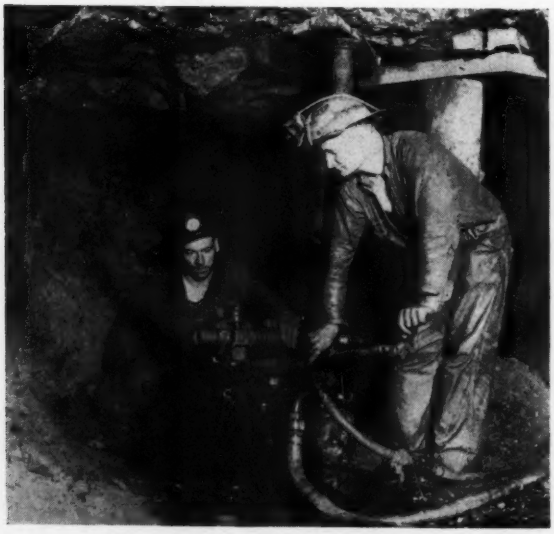
The warehouse is conveniently located near the machine shop, mill and shaft. It is exceptionally well lighted and has the latest facilities for maintaining efficient inventory and dispatching of supplies, large and small.

As shown in photograph (Pg. 23) accompanying this story the crushing plant and concentrator were constructed on a gentle down grade, below the other surface buildings. Ample space remains for construction of other buildings or enlargements depending upon future requirements. Max Kinnard is construction engineer, and W. C. Stewart surface foreman.

The engineering staff is headed by S. S. Arentz, Jr., assisted by Frank Eastman. A considerable amount of detailed geological study and mapping is required, because of the faulting and complexity of the ore beds. The large scale vertical projection (Fig. 1) showing the general position of the numerous shafts in the district and the ore-bearing beds gives an idea of the tricky behavior of the important ore horizon and the volume of information required by the mining department to guide and maintain constant development ahead of mining.

Small Slushers Used in Ore Removal

Production from the No. 1 mine and the Caselton, plus custom ore from nearby properties combine to make feed for the company mill. Ore from No. 1 is brought four miles by truck to the crushing plant but most of the production comes from the Caselton shaft. As soon as men are available development will be started at No. 1 on the 350, 400, 600, 1,200 and 1,400



Drilling a round in the stope

The small slusher hoist pulling the 29-in. scraper

levels to bring tonnage from that property up 200 to 250 tons per day. The Caselton mine has levels at 660, 840 and 1,200 ft. below the shaft collar with stations at 1,420 and 1,470 ft. The shaft bottoms at 1,502 ft.

Inside measurements of the four-compartment Caselton shaft are 4½ by 17 ft. 10 in. One is a 2-ft. manway, one a 4-ft. pumping and utility compartment and two are 4 ft. 6 in. wide used for hoisting. A Nordberg double drum hoist driven by a 200 h.p. motor serves the hoisting compartments. The skips are approximately of three-ton capacity and have cages attached for lowering timber. The man cage holds about 15 men. Compressed air for drilling is supplied from an Ingersoll-Rand PRE-type, 2,700 cu. ft. capacity unit, which is located at the No. 1 mine. A Worthington 2,500 cu. ft. compressor was recently installed at the Caselton shaft to meet larger requirements for compressed air.

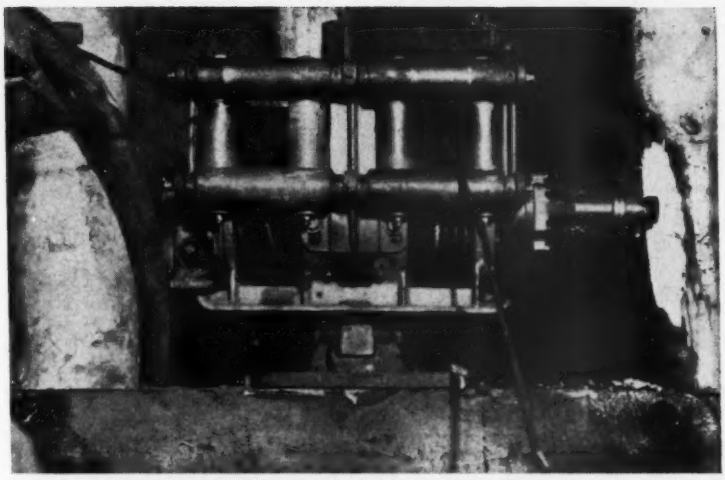
Mining is done in several places above the 1,420 level, and development of one of the larger sized orebodies is under way above the 660 level. Blocks of ore are mined out only after the respective dimensions, assays and geological surroundings of each are carefully analyzed, before a decision is made as to the best method of ore removal. Some beds are faulted making the ore horizon only 20 ft. or so wide having a dip suitable for ore removal by hand shoveling and wheelbarrows. The larger ore bodies ranging from around 30 to 50 ft. high (including ribs of shale) and about 400 feet wide are today being mined by slusher hoists and scrapers.

Since last summer the smaller type of air and electric operated slusher hoists by Ingersoll-Rand and Sullivan respectively have been used with considerable success in certain areas. In some stopes from 5 to 6.6 tons per man shift have been delivered and other places from 7 to 9.2 tons per man shift. The I-R 250-lb. slusher hoist operates on 75 and 80 lb. air pressure and is used in pulling a 26-in. scraper of the quarter-box hoe type which weighs about 235 lbs. and pulls about 600 lbs. of ore. One man and two helpers constitute the contact crew operating these units. So far it has been determined that two men with wheelbarrows equal the capacity, per shift, of a slusher. Other stopes must be worked by hand shoveling and wheelbarrows. All stoping is on a contract basis of $1.25 to $1.50 per ton of ore delivered to the chute. Several more of these small slusher hoists which weigh around 260 lbs. are now being installed and production during the remainder of the year is expected to increase substantially providing difficulties of the manpower problem do not increase.

Drilling in drifts and crosscuts is done with Gardner-Denver automatic drifters, and stope drilling is done with Sullivan safety leg stopers. Ingersoll-Rand Jackhamers are used for utility drilling. Conventional 1⅛-in. drill steel is used instead of detachable bits because the ore is soft and sharpening costs are low. Three mechanical loaders are employed in development work only, two Gardner-Denvers and one Eimco.

The broken ore in the stope is scraped and dropped into chutes, which empty into 5-ton capacity cars on the haulage level. Several locomotives are used, four 40-cell GE storage battery locomotives and one 40-cell Titan Mancha for main haulage and five Mancha mules of 20-cell capacity. Exide batteries are used in trays of 10 at the Caselton and No. 1 mines allowing free exchange of these units. There are three charging stations at each mine. The ore cars are of the side dump type which empty into ore pockets on the 1,420 level.

Some diamond drilling is done underground employing a Sullivan No. 600 drill for EX and AX holes. Exploratory drilling ranges from 40 to 400 ft. Bits used are Koebelite and Carboloy.

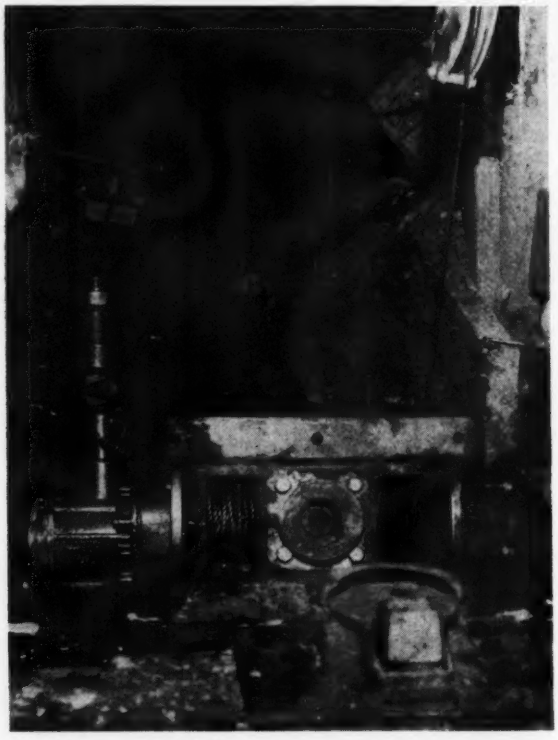


Slusher hoist type A4NM-OJ mounted on the turntable. This arrangement requires very little time to move from one set-up to another

A 29-in. all-welded steel scraper that weighs about 325 lbs. and has a capacity greater than a wheelbarrow load. Back plate and side plate are 1-in. steel. Outrigger arms are of 1 x 4 in. stock

Pumping and Ventilation

In Table I is a list of the pumps installed in the Caselton. Water is drawn from a sump on the 1,440 level and pumped to the 840 into other sumps from where it is pumped to the



The hoist turned on side to show cone bolted to the base. The turn table is fastened to an 8 x 8 in. sill. When the hoist is placed in saddle of turntable and swing nut tightened it will be ready for slushing

surface. As previously mentioned, the volume pumped is around 2,100 g.p.m. Lubrication of the pumps is carefully maintained with Lubriplate, whereas, standard Pennzoil is used for the motors.

Good ventilation is maintained through the connections with No. 1 shaft. The 1,420 level of the Caselton mine is approximately 300 ft. below the 1,200 level of the No. 1 mine. About 2,600 ft. from the Caselton shaft a raise connects the 1,200 level of No. 1 and another raise about 4,200 ft. from the Caselton, connects with the 1,300-ft. level of No. 1, which also connects with its 1,200 level. This provides ample ventilation in many parts of both mines. In some areas where auxiliary ventilation is required five Coppus fans and two American Blower fans are employed. They perform as blow fans, not suction. From the exhaust of these fans a metal tube is used and fastened along the drift for about 100 ft. which is then followed with a 16-in. diameter fabric Ventube for about 150 ft. which in turn is followed by 12-in. Ventube. Sizes of Ventube used are 12, 14 and 16. The largest size is used on the 660 level. Between 4,000 and 5,000 ft. of this type ventilating tube is used for supplementary ventilation for the scattered mining areas.

Recently a 250-ft. raise, measuring in rock section 6½ x 21 ft., was driven and completed from the 660 level, for the purpose of connecting with a large ore body in the CM bed. The raise followed a vertical 8-in. churn drill hole. Over this hole, on the surface, a 5 hp. Coppus fan was used to suck the air from the roof of the raise. This set-up cleared the smoke after blasting in about 20 minutes. R. R. Bentley is mine foreman.

Employee-Management Relations

Combined Metals Reduction Company was the first company in Nevada, as well as its other operations in Utah and Idaho, to inaugurate a week's vacation with pay after five years' service. An extra day is allowed for each following year, and with 10 years' service two weeks' vacation with pay is allowed, with payment based on the 48-hour week. The mines have been operating on a 48-hour week for some time with time and one-half for overtime (above 40 hours). Sunday is devoted for general repair work. Wages based on the 40-hour week for miners are $7.70 per day with muckers obtaining $7.20. A two-year labor contract with the International Mine, Mill and Smelter Workers Union (CIO) was signed July 20, 1942.

When soldiers were permitted to work in the mines last fall about 70 entered the employ of the company and the spirit, morale and production steadily increased. Of all the men who left the company since Pearl Harbor, 95 per cent of that total went to defense jobs and 5 per cent into the armed forces. Since that time many from the defense jobs have returned because of the higher cost of living around the defense plants. They learned the net return was greater by returning to their old jobs.

TABLE I.—PUMP DATA

Level			G.P.M.	Ft. Head	Stages	
1,420	Bill-Pump	Pomona-Turbine	555	840	24	150 hp. Westinghouse
1,420	Bertha Pump	Pomona-Turbine	740	620	..	150 hp. Westinghouse
1,420	Kate Pump	Pomona-Turbine	1,840	570	6	300 hp. Westinghouse
1,420	Minn. Pump	Pomona-Turbine	575	620	35	125 hp. removed
1,420	...(4-stage centrifugal)	Byron Jackson	1,000	900	4	300 hp. GE motor
840	Joe Lewis	Byron Jackson	1,200	700	5	300 hp. removed
840	Alice	Byron Jackson	650	850	4	300 hp. GE motor
840	Martha (sump)....	Ingersoll-Rand	900	900	2	4 G.T. 300 GE motor
840	Andy (sump).....	Ingersoll-Rand	900	900	2	4 G.T. 300 GE motor
840	George	Ingersoll-Rand	900	900	2	4 G.T. 350 Westinghouse
1,420	Patsy	Ingersoll-Rand	700	800	2	4 G.T. 200 GE
1,420	Pat	Ingersoll-Rand	700	800	2	4 G.T. 200 GE
840	Willkie	Ingersoll-Rand	800	800	..	.....

Loading station at 1,470 level.

Shaft bottom at 1,502 ft.

Good Records For Safety First Achieved At Combined Metals

Belief in the importance of mine safety brings miners to their fourth year without a fatal accident.

By DEWEY T. SULLIVAN
Safety Engineer
Combined Metals Reduction Company

A GENERAL description of the accident prevention program maintained at the Pioche plant, Combined Metals Reduction Company, as a part of the mining and milling operations is as follows:

From the standpoint of accident prevention we try to beat old man hazard to the punch. We well know that major mine accidents can and do happen in the metal mine and that all operators have that condition hanging over their heads. We trust that we will always be ahead of such impending dangers and are able to ward them off before they materialize into a reality.

Our general run of accidents are quite familiar to most mine operators and our total number might seem quite high due chiefly to the fact that we require a written report of each accident regardless of the severity and insist that each injury receives immediate medical aid. We are firm believers in, "Beat infection by Medical Attention."

Our semi-monthly safety meetings, the attendants consisting of all foremen and department heads and a three-man committee of the local CIO employes, form the nuclei from which our safety program functions. Here all matters pertaining to plant safety are openly discussed.

All lost-time accidents are thoroughly analyzed as to the cause and how to prevent a recurrence. Such accidents are investigated jointly by a three-man Union Safety Committee and the plant safety inspector, with separate reports from this committee and the safety inspector. We have experienced very fair reports as the responsibility of each accident and no punches are pulled. These typed reports are posted on the mine bulletin boards.

A monthly mine safety inspection trip covering all working places and haulage ways is a part of the mine safety program. This personnel also consists of an appointed three-man committee from the local union with different personnel for each inspection, and the mine safety inspector. The management allows these three union employes their regular day wage for the inspection.

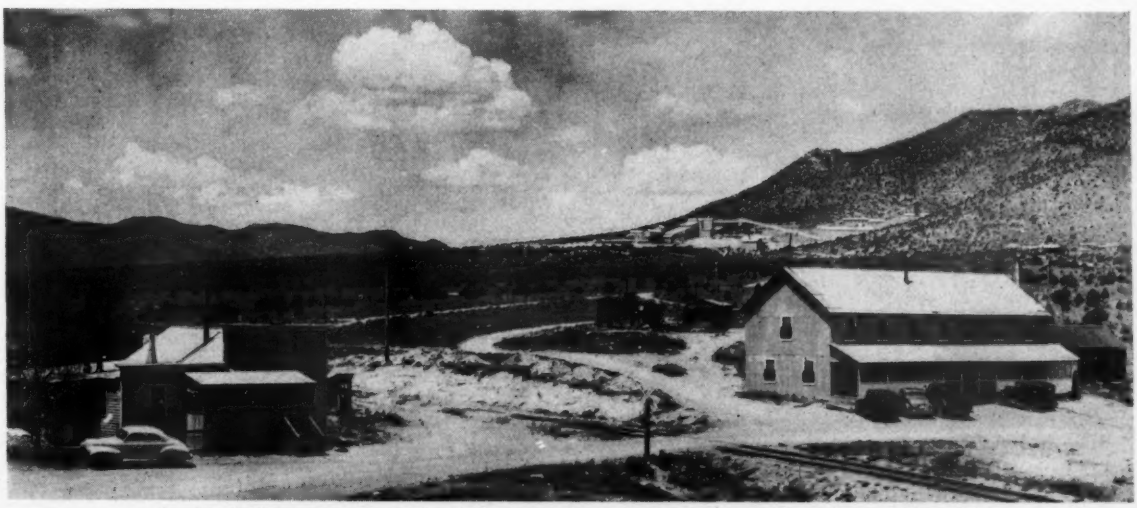
The entire plant including mine, mechanical, electrical, mill, accounting, construction, and assay departments are divided into four groups, alphabetically by departments so that each group has about the same safety hazards. Picture show tickets are given to the employe members and their immediate dependents for each group having no time lost accidents during any calendar month.

We strongly desire safety suggestions from the employes. A prize of $5 is given for the best suggestion offered during each calendar month as decided by the safety inspector and a three-man employe committee. All employes except the safety inspector and the superintendent are eligible for the prize, although they are expected to offer a good share of the suggestions.

Complete first aid dressing stations are located at convenient places on surface and underground and first aid kits are carried into working headings. We have a mine rescue station on surface and fire fighting equipment in each department is inspected regularly.

First aid and mine rescue training classes are the highlights of our safety program. Through the cooperative supervision of the U. S. Bureau of Mines we hold our annual training. Following the cooperative provisional instruction system we trained 100 per cent in 1941. This year we hope to do as well.

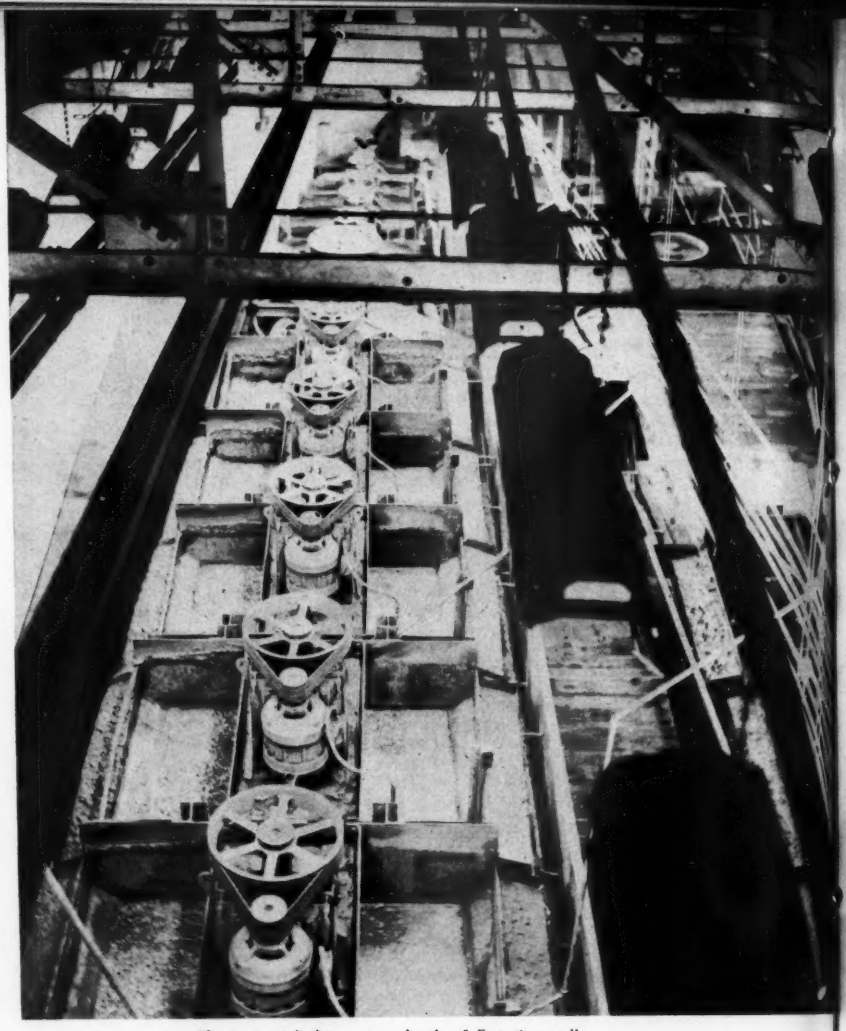
For a number of years, safety records have been filed and through them we have set our goal. We are extremely proud of the fact that we have started on our fourth year without a fatal accident.



Combined Metals concentrator in the background, men's dormitory on right and mess hall on left

A Modern Mill Treats the Combined Metals Ore

By JOSEPH B. BLOW
Construction Engineer, Metallurgist



Fluorescent lights over a bank of flotation cells

Fine grinding and selective flotation provide the separation and recovery of the important war metals. Compact mill has facilities to eventually treat 1,000 tons of ore per day.

THE METALLURGY like the geology of the zinc-lead ores of Combined Metals Company was difficult. When selective flotation was a much discussed subject in the twenties, Mr. Snyder worked on the dressing of the complex ores found in the limestone beds in Pioche, Nev. Joining him in this study as the years passed were N. C. Christensen, A. J. Miller, and W. G. Fagergren. The first plant was built at Bauer, Utah, in 1923, to treat zinc lead ore mined there as well as the lead-zinc complex ores shipped from Pioche. When this plant was in operation ore dressing research continued under the direction of the late W. D. Green, W. H. Kelsey and R. J. Evans.

By the time the modern plant at Caselton was ready to be designed in 1939 the company was well fortified with knowledge on the character of the Pioche ores and how they could be treated. The Caselton mill was completed in 1941 and the following is a description of the mill operation.

The crushing plant, conveyor shed, and mill proper all have the feature of not having windows. The frame work of these buildings is of structural steel lined on the inside with smooth "Seal of Quality" galvanized sheets and on the outside corrugated galvanized sheets. The lighting fixtures in the mill are fluorescent lamps which supply the type of light said to be more advantageous for noting the color of the zinc and lead flotation bubbles.

Ventilation in the mill is supplied by a 6-ft. diameter American Blower suction fan electrically driven which is located in the extreme upper corner of the mill. It is operated by a 50 h.p. motor.

Ore is hauled by Ford 2-ton trucks from the Caselton shaft ore bin and dumped onto a surface grizzly with 10-in. openings. The haul from the shaft to the grizzly is about 400 ft. The steel grizzly is about 30 by 20 ft. and is flat with the ground. This arrangement permits the bulldozing of accumulated customs ore from the Prince Mine three miles away and the Ely Valley Mines about four miles distant directly into the grizzly. The railroad haul from the Prince Mine is about three miles over a standard gauge railway. The haul from the Ely Valley Mines is by truck.

Ore from the grizzly passes through a chute onto a belt which feeds ore onto a 40-in. Goodyear incline conveyor belt. A Dings magnet removes the heavy pieces of iron, and near the end of the incline is a tramp iron detector (Utah Copper type) which sounds a gong if a piece of iron is submerged in the ore flowing on the belt.

The ore from the conveyor belt drops and passes onto single deck Ty-Rock (Tyler) Vibrating Screen equipped with rods set to 1 in. The oversize passes into a 4-ft. Traylor gyratory crusher. The primary screen undersize and the product from the 4-ft. gyratory join and pass to a secondary crusher, a TS-3-ft. Traylor which features double crushing. These products are conveyed to 2 Tyler Single deck screens with ⅝-in. openings. Oversize from these screens are conveyed back to the TS-3-ft. Traylor crusher. The crushed ore averaging ⅜-in. size is then conveyed into a sampling machine which takes a 10 percent sample. All of the ore stream is sampled part of the time. The

sampled products drop into a chute which empties directly into a trap in the sampling room.

The ore from the crushing plant is weighed by a Merrick Weightometer and is conveyed over an incline Goodrich 30-in. conveyor belt which empties the product onto a Stephens-Adamson transfer unit which in turn empties the ore into one of four storage bins, each of 550 tons capacity.

From the bins the ⅜-in. ore is conveyed again, and weighed by a Merrick Weightometer and fed into a 10-ft. Hardinge Ball Mill. Three-inch forged steel balls are used in this mill. The ball mill is V-belt driven by a 300 h.p. Westinghouse motor. The ball mill product passes to a 6-ft. Akins Classifier, where overflow sands are returned to the ball mill. The flotation feed from the classifier (about 75 to 80 per cent minus 200 mesh) is pumped about 25 ft. by means of a 6-in. rubber-lined Allen-Sherman-Hoff pump into an 8-ft. surge tank which supplies the feed to the rougher lead flotation circuit.

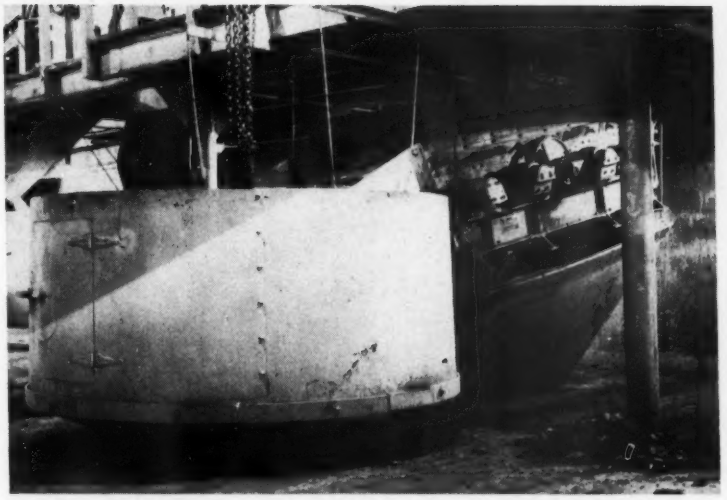
The flotation reagents floor is conveniently placed above and in back of the Akins classifier and Hardinge ball mill. Ample open space permits the reagent operator to observe the froth of all the various groups of lead and zinc cells and adjust the control of reagents from this observation post.

The first group of rougher lead cells consist of five 66-in. Fagergren flotation cells made by American Cyanamid Co. These are operated by five 15 h.p. V-belt driven Allis-Chalmers motors. The product from the rougher lead cells passes through three groups of two Fagergren 56-in. cells for further cleaning. The lead concentrates flow by gravity into a sump of a bucket elevator which lifts the material 60 ft. into a junction box where the material is fed into a six-leaf American type Eimco filter.

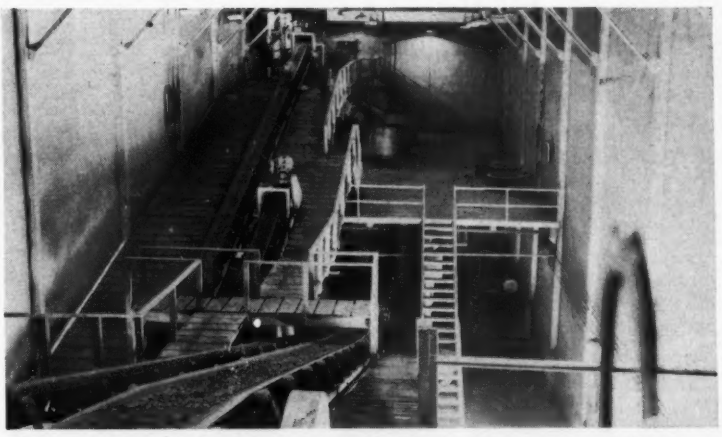
The tailings from all the lead circuits flow into a surge tank and is pumped to the head of the zinc flotation circuit. This material is pumped by a B-Frame Allen-Sherman-Hoff pump. Two 6-in. Pomona Pumps are used in the sumps.

The zinc rougher flotation circuit consists of seven Fagergren 66-in. cells followed by two groups of three cleaner cells and then one group of two cells, all of 56-in. size. Each of these cells are V-belt driven by a 10 h.p. Allis-Chalmers motor.

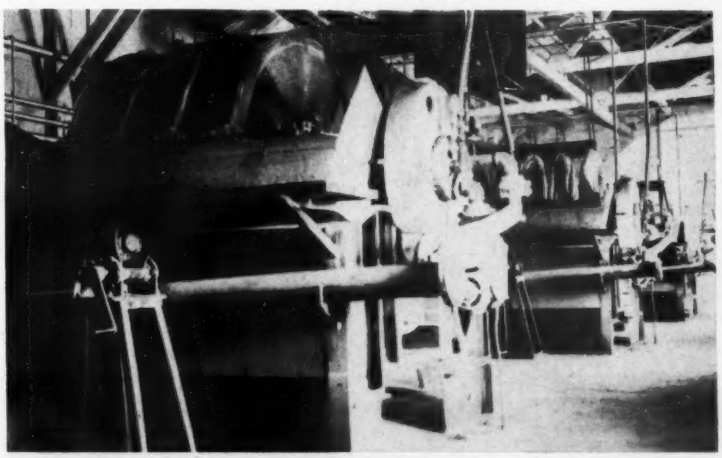
Zinc concentrate from all of these cells flows to a sump of a bucket elevator where the material is elevated about 60 ft. and fed into a junction box which feeds into the zinc filter wells. The filtered lead concentrate drops directly into a freight car gondola which is hauled to the International Lead Smelter at Tooele and the zinc concentrate is hauled to the zinc plant at Anaconda, Mont.



A Tyler vibrating screen sizes the material and passes it into the 2-stage Traylor gyratory crusher



The product from the two gyratory crushers in the background is conveyed to four storage bins of 550 tons capacity



Three Eimco disc type filters dewater the lead and zinc concentrates

Some Hints on Maintenance and Conservation Frequently Overlooked

Wire cables, rollers and buckets on aerial tramways need careful watching these days

With prospects of a long war ahead, operators and miners must recognize the need of thought and attention to details previously considered unimportant or insignificant in the everyday care of supplies and equipment.

Editor's Note: This article was abstracted from chapters in a war-time manual of pointers and recommendations for the maintenance of construction equipment and facilities, prepared by the Associated General Contractors of America, Inc., Washington, D. C. Many manufacturers serving the entire mining industry cooperated in supplying data for this comprehensive book.

DURING WARTIME convenience must often be sacrificed in the interests of economy in the use of critical materials. On the other hand, manpower frequently is more important than material considerations. The balancing of these elements should be carefully considered and the weight of decision placed in that arm of the scales which will register to the greatest advantage of the nation's conservation program. The following suggestions frequently overlooked in the mines and other war industries are offered as a guide to those who have before them the solution in maintenance and conservation.

Fundamentals for Conservation of Rubber

It is highly essential that all users of rubber products be fully aware of the absolute necessity of conserving this critical substance. The subject should receive the most careful consideration and every possible measure should be adopted to impress upon all employes their individual responsibilities in the matter.

There are certain general rules to be observed in the care and preservation of rubber which apply to industrial rubber products. For example, rubber products should always be kept in dark places in storage and should not be exposed to bright sunlight any more than is necessary, since sunlight deteriorates rubber. Oil, grease and gasoline should never be permitted to remain in contact with rubber for an extended period. Extreme heat and cold are also harmful. If stretched or flexed when extremely cold, fracture may result and in any case the material will be damaged.

Extreme heat will result in disintegration and possible separation of rubber from fabric. Ozone which is frequently present in the atmosphere surrounding operating electric motors and generators is injurious to rubber. Abrasion should be avoided, as it not only wears the surface but tends to separate the rubber from fabric reinforcement. Rubber products which are constantly being strained by tension, compression or flexure deteriorate much more rapidly than under normal conditions—hence these strains should be relieved whenever possible.

Tires for Trucks and Automobiles. There are two prime factors which will contribute largely to extending the life and satisfactory performance of rubber tires, namely, skillful and careful operation of the vehicle, and the maintenance of correct mechanical adjustments. A good driver will start and stop carefully to avoid skids and slips. He will drive with caution

to prevent road shocks which cause rupture. He will drive at slow speeds over rough roads and will avoid rough roads whenever possible. He will reduce speed at curves and corners and will keep his loads within reasonable limits. Inspection of tire equipment should be frequent and thorough.

Pressures should be maintained with care by pressure gauge, preferably *each day*, and needed repairs should be promptly made before water and dirt shall have had an opportunity to cut into the fabric. The careful operator will avoid striking curbs and scraping the sidewalls or tires.

The equalization of brake adjustments should receive frequent attention. Wheels should be kept in alignment and sprung axles or distorted wheels should be corrected. Bent or damaged rims should be repaired. Wherever dual tires are used, it is bad practice to mount a new or nearly new tire beside one that is badly worn down. Such an arrangement puts practically all the load, which should be carried on two tires, on a single tire.

Great care should be exercised in mounting tires so as not to break or rupture the casing or pinch the tube. Never put a tube into a casing until it has been positively determined that no sand, stone, or other substances which might injure the tube or the inside of the casing, are present. If a tire has been punctured, be certain that the cause of the puncture has been removed and the hole properly sealed before remounting the tire. Valve caps belong on the stems and should always be kept there. Each driver should keep in his vehicle an adequate supply of tire valves and caps.

Heavy equipment such as scrapers, graders, trailer wagons, etc., require special tires of very heavy and expensive design. They have to endure the hardest kind of service and frequently are used almost entirely on very rough terrain. They should be inflated with due regard to the nature of the material over which they are required to travel. On scrapers working in loose, sharp rock, for example, pressures should be maintained about 10 lb. below those recommended for normal service in order to reduce the danger of serious cutting. Heavy equipment tires often have deep tread configurations which become clogged with mud. Unless such equipment is washed frequently, deep cuts and harmful abrasions may go undiscovered and unrepaired until serious injury to the tires results. Rocks and stones should never be permitted to remain between the sidewalls of dual mounted tires. Rupture is almost certain to ensue if this precaution is neglected.

In connection with the subject of tire maintenance, attention is directed to the importance of keeping drives and roads, over which continuous travel by construction vehicles is required, free from boulders, rocks and bad chuck holes. Lumber with nails, bottles, cans, glass and other substances destructive to tires should be removed as soon as discovered.

Rapid service mine hoists need thousands of feet of wire rope which require proper lubrication

Conveyor Belting. Conveyor belts are very costly and should receive exceptionally careful handling and repair. Nearly every conveyor installation constitutes a major problem in itself, requiring individual study and design. The services of specialists in this field are always supplied by manufacturers of conveyor equipment, and these services should be used whenever possible.

After a conveyor belt has been properly installed it should be frequently and thoroughly inspected and needed repairs should be made promptly. Careful attention to this detail will undoubtedly defer the necessity of major repairs. The nature of the injury sustained by a belt determines the character of the repairs which are necessary. Temporary repairs may be made by using self-vulcanizing cement and plastic rubber compounds. In such cases care should be used to remove dirt, grease and loose rubber before applying cement and new rubber. Permanent repairs should be made by the use of small portable electric vulcanizers.

Conveyor idlers should be kept thoroughly lubricated and in proper alignment and should be inspected with great frequency to see that they revolve freely. This detail is often

Small repair jobs on conveyor belts and idlers should be made as soon as possible

Trucks in the metal mining industry such as this one in the Lake Superior iron district are doing an important wartime job and proper maintenance is a "must"

neglected but it is one of the most important factors in assuring the long and efficient life of conveyor belting and machinery.

Installations of elevator belts are attended by many of the same problems as are conveyors. Elevator buckets should be properly spaced on the belts to handle the type and volume of material for which the elevator is designed. Abrasive materials which may collect between buckets and belts is exceedingly destructive. A short strip of discarded rubber belting bolted between the bucket and the belt will prevent much wear from this cause. Do not permit slipping of elevator belts. Should it occur, determine the cause immediately and remedy the trouble without delay. Do not use belt dressings.

Rubber Clothing, Boots, etc. In addition to the conservation methods prescribed for other rubber products, rubber boots, gloves, coats, hats, etc., need special consideration. Wet boots should be carefully dried inside before being stored. One way of doing this is to fill them with oats. Do not use sawdust for this purpose as it may create a harmful acid. Just because you have rubber boots and other items of rubber clothing on the job they should not be worn except when necessary to the comfort and health of the workman. As soon as the need for rubber clothing ceases the employe should be required to remove it and return it to the storehouse where it should be cleaned, dried and stored.

Rubber coats should be stored by hanging freely on common wooden coat hangers. They should not be folded or piled upon each other. Creasing of rubber goods should be avoided wherever possible. Often garments of oil-treated fabric may be substituted for rubber clothing.

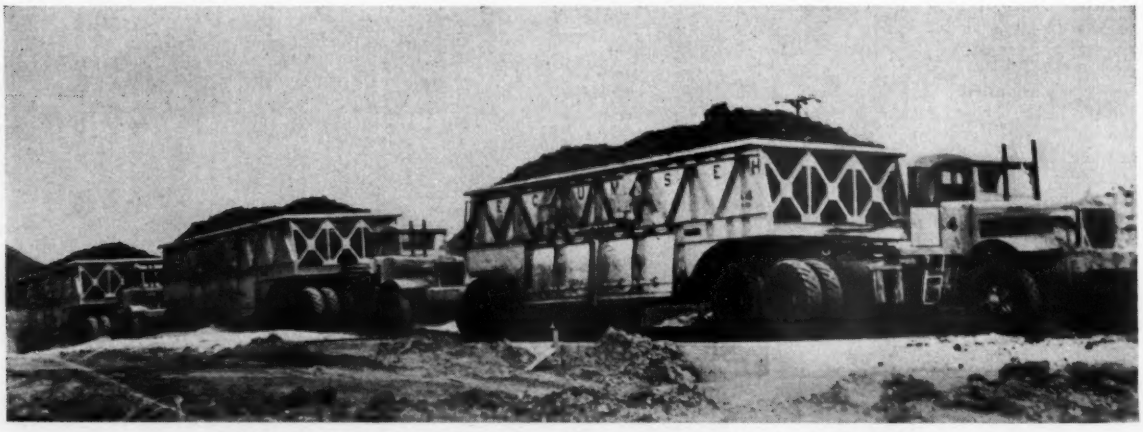
Miscellaneous Rubber Products. Gaskets, motor mounting pads, washers, pump diaphragms, tubing and other items hitherto considered relatively unimportant must now be conserved with utmost care. Often they can be produced from other discarded rubber products such as old belting, discarded hose, etc. Substitutes of fiber, paper or textiles should be used wherever possible. Never discard a piece of rubber of any kind until the possibilities of its reuse in some capacity are fully explored; then if found useless, see that it is salvaged as scrap.

General Precautions and Maintenance of Wire Rope. Scientific research on the part of manufacturers has resulted in the production of many types of wire rope designed for specific purposes. The selection of the rope best adapted to a particular need is important. There are many factors to be considered in making this choice, the first of course, being load capacity. Overloading should be avoided. On the other hand, the selection of a rope of too large capacity is wasteful.

The factors of safety that should be employed in determining the sizes and types of rope for different purposes vary considerably. For static ropes, strands for guying, suspension ropes for bridges, etc., minimum safety factors of from three to four are commonly used. Haulage rope on excavating buckets, drag lines and similar equipment should be selected with a safety factor of from four to five. Industrial hoists should carry a safety factor of six.

Other points to be taken into account are the running speeds, load shocks, working temperatures, and sheave sizes. The advice of expert wire rope specialists should be sought and followed.

Proper lubrication is essential to the satisfactory performance of wire rope. In active service there is present, in addition to external friction, constant movement of the individual wires upon each other, and although this movement is minute, lubrication is necessary to prevent destructive wear. Ropes of the better grades are well oiled during their manufacture



Mud frequetly hides abrasions in the heavy duty tires used in hauling coal from strip mines

or before shipment and the fiber cores used in the center of many types are thoroughly impregnated. However, continued service wears away this lubricant and it must be renewed. The application of oil also serves to prevent rusting. Discarded crank case oil may be used on wire rope, and occasional applications of a 50-50 heated mixture of red engine oil and boiled linseed oil is sometimes used. Lubricants may be applied by various methods; probably the most common being by means of a fairly stiff paint brush. For some installations suitable grease mixed with finely powdered graphite is applied in the field.

Great care should be exercised in removing wire rope from shipping reels. If possible, the rope should be run directly onto the drum where it is to be used. Rope should be unrolled from reels or coils in a straight line. Whenever practicable, reels should be mounted on spindles for convenience. Never remove rope from a reel or coil that is laid flat; uncontrollable spirals and strength impairing kinks will inevitably result.

When winding ropes on drums or reels, be sure that the turns are started correctly so that they will lie flat and will not cross each other. A right-lay rope should be started from the right flange of a drum when facing it from the rope side, and a left-lay rope from the left flange. It is economical practice occasionally to remove cables from drums, cut off a foot or so from the dead or drum end and re-wind. This will change the location of the points where the cable rides up to form a new layer of turns on the drum and will lengthen the life of the rope by distributing the wear. Great care should be taken in cutting rope. It should never be put into a vise. On each side of the proposed cut the rope should first be securely "seized" or bound with strong wire and the cut made between these bindings.

In mounting rope, every precaution should be taken to attach end connections and fittings so that each strand or wire shall bear its share of the load. The axis of a socket or eye connection should always be in exact alignment with the axis of the rope itself.

Splicing of wire ropes should be done in such a manner as to equalize the load on the strands. It should be done only by one experienced in such work. If poorly done, early failure of the rope may be expected. When saddles or clips are used for rope fastenings, the saddle should always grip the live or load side of the rope with the U-bolt passing over the dead or idle end. Never alternate or stagger the relative positions of saddles and never depend upon a fastening made with a single clip. Keep the nuts on U-bolts well and uniformly tightened. Frequent inspections are desirable.

Miners have a wartime "nursing" job to keep rubber hose from becoming kinked and bruised in underground handling

Hoist and Power Rope. In addition to the general precautions to be observed in the care of wire rope, there are some others which apply particularly to ropes used for hoisting and power application. Ropes procured for such purposes should be selected with special consideration of the operating conditions under which the machinery has to work. Sizes of sheaves, speed of travel, nature of the loads to be handled and similar considerations must be taken into account. Again it is emphasized that the rope manufacturers should be consulted in this important matter.

It is advisable occasionally to remove hoisting ropes from their drums, turn them end for end and remount them. This helps to reduce abrasion and fatigue by placing in action parts of the rope that might otherwise be comparatively idle. For a distance of from 5 to 20 ft. above the point of attachment of the load on a rapid service hoisting rope, such as is found on hoists, cranes and shovels, fatigue generally occurs due to crystallization caused by rapid vibration. It is considered good and safe practice to cut off this deteriorated section at intervals of about one-third the estimated life of the rope.

Use sheaves of as large a diameter as is practicable. In mounting them be sure that they are in perfect alignment with each other. This will prevent the rope from riding the sides of the flanges which causes serious abrasion. Do not use sheaves that are too heavy as they have a certain static friction and inertia which must be overcome every time the rope moves, causing a grinding action on the rope. If the use of small sheaves is made necessary by mechanical limitations, ropes of special flexible design made for such purposes should be procured. The surfaces of grooves and flanges of sheaves should be in smooth condition at all times. The rope should sit freely in the bottom of the groove. These grooves should be shaped carefully from steel templates. Where the nominal wire rope diameter is ¾ in. or less, the minimum groove tolerance should be 1/32 of an inch and the maximum groove tolerance 1/16 of an inch. Corresponding figures for larger ropes are 3/64

and 3/32 in. The grooves in sheaves can be maintained in excellent condition by welding and metal spraying processes.

Every precaution should be taken to prevent hoisting ropes from twisting; tag lines should be used to prevent a spinning of loads when a single part line is used.

All hoisting and power ropes, with one exception, should be frequently and thoroughly lubricated. That exception is the drag-in haul cable of a drag line or dredge. These ropes operate in wet sand and mud and, if greased, have a tendency to carry abrasive material into the main gearing of the machinery.

Cleaning and Painting Equipment

Preliminary to the thorough inspection of equipment, which is so essential to its conservation and maintenance, it should be thoroughly cleaned. Electric motors, generators, welding equipment and other items susceptible to injury by water or dampness should be cleaned by the careful use of compressed air. By this means dust and dirt can be blown out of field and armature windings and commutators and other spaces too small to admit the hand or a brush.

Earth moving equipment, concrete mixers, chutes, buggies, etc., especially require frequent and thorough cleaning. Only in this way is it possible to detect impending failure of vital parts in order that they may be repaired before idleness of the equipment is enforced. Special machines of different makes are available for this purpose in which steam is generated at high pressure, is passed through and mixed with various cleansing solutions and is then sprayed upon the machine to be cleaned. Various types of nozzles are employed to reach inaccessible places. These devices are exceedingly efficient in removing dirt and grease which may be closely packed into corners and crevices. Cracks in castings and worn parts are thus clearly exposed to the inspector. Frequent cleaning by this method serves well to minimize wear and tear caused by the presence of mud and sand in moving parts. It is practically impossible to do a thorough job of cleaning of tractors and heavy earth moving equipment except by this means.

Concrete equipment requires special cleaning methods. Mixer drums, buckets, chutes, buggies and all machinery used in mixing and depositing concrete should be frequently and thoroughly washed with clean water delivered under heavy pressure from a hose. This should be done at the close of each use period, before concrete that may remain in corners and angles may have an opportunity to set. If neglected, the cleaning operation becomes a difficult and expensive hammer and cold-chisel job which is damaging to the equipment.

The steam or vapor cleaning process may also be applied to gasoline and diesel motors. The removal or protection of ignition devices, storage batteries, instruments, etc., is, of course, necessary in such cases. In fact in using steam, compressed air or water under pressure for cleaning machinery, extreme care should always be used to prevent dirt from being forced into bearings. Covers of oil holes and grease cups should be tight and sealing gaskets and washers should be in good condition before commencing cleaning operations.

Frequent painting of equipment yields excellent returns in the conservation effort. All the rules governing preparation of surfaces and the application of paint in general apply to the painting of construction machinery. Only paints of superior quality should be used. Many paint manufacturers make products especially for use on construction machinery, and it will be found desirable to consult with them as to the best methods and materials to be employed for refinishing any particular piece of equipment.

The selection of colors is exceedingly important. Avoid shades that tend to conceal the presence of dust, dirt, cement, grease, etc. Never use gray paint on concrete machinery or equipment that is to be used where much dust is likely to be present. Avoid the use of black paint, as it conceals the presence of harmful dirt-collecting grease. Orange, yellow and red shades are frequently used for heavy exposed machinery for two reasons: first, because they reveal the presence of dirt and grease, and second, because machines painted with these colors have high visibility which is a great advantage for safety.

OMISSION

In the article entitled "Lead—Saver of Critical Materials," on page 17 of our January issue, the usual "by-line" was inadvertently omitted. This article was written by the Lead Industries Association, New York, N. Y. The preface accompanying this article was by Erwin Vogelsang, director, Tin-Lead Branch WPB.

10 Commandments for Oxygen Conservation

IN THE latest publication of *Airco in the News*, Vol. III, No. 1, are listed 10 important reminders to operators of welding equipment. It points out that the simple difference between good and bad welding or cutting practices can be just as toll-taking as the difference between a convoy without incident, and one attacked by submarines. Gas wasted and equipment damaged by a careless individual may not seem great; but multiplied by our great army of workers such waste can easily spell the difference between ships not launched, and those that were when they were most needed.

Oxygen is a critical material. If war production is not to be hampered by its lack, every welder must take its conservation as his or her personal responsibility.

Here are 10 commandments practiced by employes of the Oregon Shipbuilding Corporation for oxyacetylene welders and cutters. Their observance in every mine plant as well as shipyard will avoid waste and hasten victory.

1. **Use the Proper Size Torch Tip.** A No. 2 tip used instead of a No. 1 in cutting one-half inch plate consumes 10 percent to 20 percent more oxygen, 16 percent more acetylene—all wasted.

2. **Do Not Use Excessive Pressure; Take Time to Refer to the Pressure Chart.** Manufacturers' rated pressures are the most efficient for average conditions.

3. **Disconnect the Hose** at the cylinder or manifold when you have finished your job.

4. **Check Hose and Connections for Leaks.** A 1/64 inch hose leak under 100-lb. pressure will waste 290 cubic feet of oxygen in 24 hours—more than a tank full!

5. **Use Correct Diameter Hose.** A hose that is too small for the job requires higher gauge pressure to secure sufficient flow, causing unnecessary strain and leakage.

6. **Short Lengths of Hose.** Long hose requires higher pressure and unnecessary wear.

7. **Return Empty Cylinders Promptly.** Idle cylinders are production slackers.

8. **Don't Leave Torches Burning When Not in Nse.**

9. **Keep Tips Clean and Free From Carbon and Slag.** An unclean tip is inefficient and will slow down work in spite of using the proper pressure and speed.

10. **Don't Abuse the Cylinders.** A damaged cylinder must be taken out of circulation.

Open pit mining at Iron Mountain, Utah. The churn drill at the left is drilling a hole into the ore, which later will be blasted

Iron Ore Output In Utah Increasing

Open cut mining operations by the Columbia Iron Mining Company is being expanded to supply iron ore for the new steel plants being erected in Utah.

THE IRON ore which will be charged into the new blast furnaces being constructed at the Geneva Steel Works near Provo, Utah, will be obtained from Columbia Steel Company's iron mine at Iron Mountain near Cedar City, Utah, according to the Department of Public Relations, Columbia Steel Company.

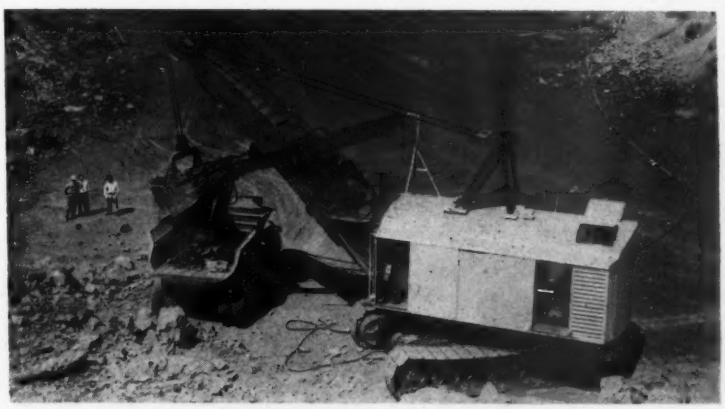
Back in 1851, a group of Mormon pioneers was sent to found Cedar City, Utah, by Brigham Young, head of the Mormon Church. It was a dual mission. Colonizing was one objective. The other was to develop the mining and smelting of iron ore which was known to be in this general area.

Early in the summer of 1852, work was started on a blast furnace. September 29 of that same year, the first charge was put into the blast furnace and a small amount of iron was tapped the next day. When Johnston's army came into Utah, operations ceased. Some of the remains of an early blast furnace and other buildings are still in a good state of preservation.

From that time until the early 1920's, iron mining and smelting in this area were spasmodic. First one group and then another tried to mine and smelt the iron ore. It was not until 1923 when the Columbia Steel Corporation, predecessor of Columbia Steel Company, a U. S. Steel subsidiary, stepped into the picture that the Iron Mountain Mine became a large-scale operation. In the meantime, the idea of smelting the iron ore in this locality had been abandoned.

At the present time, Columbia Iron Mining Company is shipping iron ore to Columbia Steel Company's blast furnace at Ironton, Utah. As was said previously, the ore also will be shipped to the Geneva steel plant.

Iron ore in this area is mined by the open pit power shovel method and will continue to be so mined for some time. The ore from the Iron Mountain mine is rather high in iron content, running around 53 per cent.



A 2½ cu. yd. electric shovel fills the truck

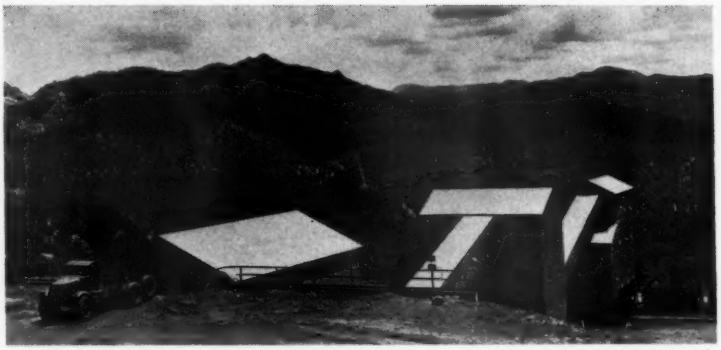
Around 200 workmen will be employed in the expansion work, which will increase the output of the mine by about nine times. When the iron ore is shipped from the expanded operation, approximately the same number will be employed.

The Black Hawk iron ore body which is one of the iron mine operations at Iron Mountain is open pit. This development was initiated at a point 700 ft. from the receiving hopper of the primary crusher in the Iron Mountain area.

In the mining operation, 6-in. churn drill holes are sunk in the ore and blasted. Because the ore is rough and irregular, considerable secondary blasting is required to prepare it for removal by power shovel operation.

After the necessary drilling and blasting, the iron ore is loaded into large trucks having a capacity of 28 long tons by 2½-cu. yd. electric shovels. From the loading point, the ore is hauled to the receiving hopper at the primary crushing plant.

When the ore has been dumped into the receiving hopper, a pan feeder conveys the ore to a 40 x 60-in. jaw crusher. The product from the jaw crusher feeds onto a 30-in. conveyor belt which brings the ore along to a scalping screen which by-passes the finished product. The over-sized pieces pass through either a 2-in. reduction crusher or a 5-ft. 1-in. cone crusher. The chunks of iron ore which result from this operation, all of which are 2 in. or less in size, are conveyed to a double-deck finishing screen by the 30-in. conveyor belt. This screening operation produces three grades and sizes of ore. The first grade measures under 5/16 in. The second grade is from 5/16 in. to 1 in., and the third grade measures from 1 in. to 2 in. The ore is then ready for loading into railroad cars from where it is shipped to Columbia Steel Company's blast furnace near Provo, and to Ironton, Utah.



Dumping iron ore into the crushing plant

Construction of the $150,000,000 Geneva Steel Works near Provo, Utah, is progressing as well as can be expected in the face of a difficult priority situation, according to officials of Columbia Steel Company. It is now estimated that the Geneva plant will not be in operation much before the end of 1943, despite previous mid-summer estimates.

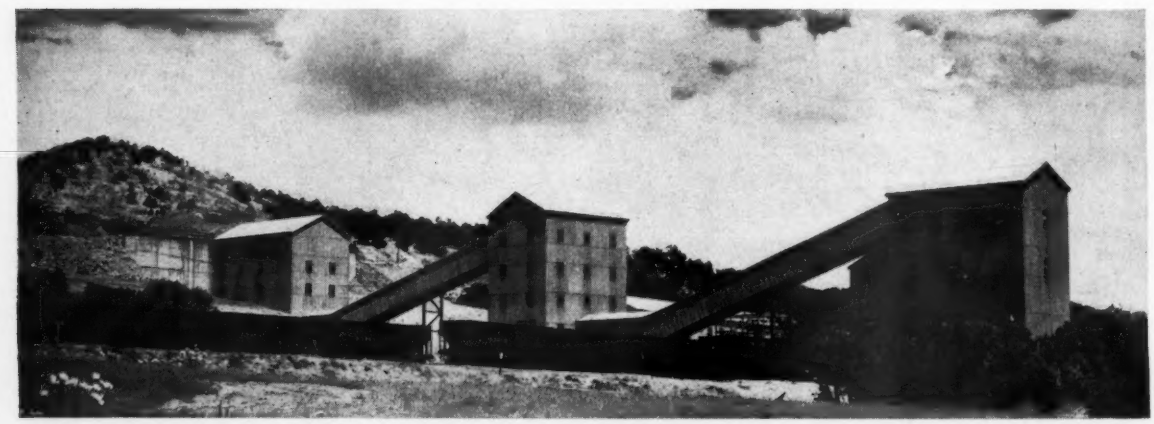
Now that parts of the huge steel plant are well into the steel erection stage and other parts are fast approaching that stage, the stringent steel priorities are operating to slow up construction.

This largest integrated steel mill west of the Mississippi is being built by Columbia Steel Company, U. S. Steel subsidiary, for the Defense Plant Corporation. It is designed to help supply the war shipbuilding needs of the Pacific coast. When completed, the Geneva plant will supply an additional 750,000 tons of steel yearly for war purposes.

The raw materials—coal, iron ore, limestone, etc.—to feed 252 coking ovens, three pig iron furnaces, and nine steel furnaces will be obtained in Utah. Steel plates and structural steel will be the end-products of the operation. In addition to steel, four batteries of coking ovens will supply considerable quantities of tar, gas, ammonium sulphate, motor fuel, etc., as by-products of the coke conversion process.

To assure a constant supply of coking coal, the new Geneva coal mine has been developed and is in production in southeastern Utah with a possible daily capacity of 8,500 tons. The iron ore will come from Columbia Steel Company's open pit mines in southern Utah, which are being greatly expanded. Limestone will be secured from large deposits near the steel plant.

For many years, Columbia Steel Company has been operating a blast furnace at its Ironton Plant near Provo, Utah. The national government, through the Defense Plant Corporation, is adding another larger blast furnace, which went into production of pig iron around the first of March. It is producing about 950 tons of iron daily, destined for the Pacific coast war effort. The ore for these two blast furnaces is supplied from the iron ore mine near Cedar City, described earlier in this article.



These buildings house the crushing and screening equipment which prepares the iron ore before it is shipped to the blast furnace

How an Eight-Mile Conveyor Belt System Reduced Delays In Coal Haulage

Transport over long hazardous roads was eliminated when conditions were found suitable to bring coal from more than one mine by conveyors to a river loading tipple.

By EARL J. JONES
President
Muskingum Coal Co.

IN 1935, the author started mining coal for delivery to The Ohio Power Company at Philo, Ohio. At that time one mine was put into operation and the equipment employed consisted of Jeffrey M. & W. chain conveyors with Joy 8 BU loading machines and Joy belt conveyors for main and butt entry haulage. The Muskingum Coal Company had a long-time contract with The Ohio Power Company at Philo in 1937 and the company mined and shipped coal from a hand-operated mine located on the Muskingum River, on the opposite side from where the present terminus of our long conveyor belt line is now located. Immediately after securing control of the Muskingum Coal Company, I ordered this hand-operated mine closed, and proceeded to set up a second all-mechanical mine similar to the one already in operation. In this new mine, four 8 BU Joy loading machines together with Joy main and butt entry belt conveyors and Joy W chain conveyors were installed. Tonnage was increased from the two mines, eventually reaching an average of 4,500 tons per day, and all of this coal was trucked a distance of approximately seven miles to the Muskingum River where it was loaded into barges for shipment to Philo, Ohio.

In the trucking of this coal, many difficulties were experienced, such as bad roads from spring thaws, fog as well as severe snow and ice conditions which made operations highly dangerous on the highway. However, in the continuous operation of truck haulage nothing was allowed to interfere with the movement of the coal except impregnable fog which on many days would cause us to hold our trucks up anywhere from one hour to six or eight hours. In the course of this trucking operation, from the time of inception to the time of installation of the conveyor belt line in 1942, we made approximately two and a half million trips by truck, aggregating approximately 18,000,000 truck miles. All of this mileage was traveled without the loss of a single man in the truck operations through accidents. As a matter of fact, State Industrial Compensation records show that less than $700 was paid out in compensation premiums to any or all employes of this operation over a period of seven years. What payments were made were caused from minor scratches or sprained ankles or wrists, but never during the course of the entire trucking operation did any employe moving coal by truck suffer so much as a broken bone.

In the moving of coal by truck and its consequent annoying interruptions caused by fog and discomfort to the operation by ice and sleet and bad roads, it naturally brought about many thoughts of improved haulage facilities which was finally started by a survey for the installation of an all-belt conveyor from the mines to the river. Installation of this conveying system was started in 1941 and completed in the spring of 1942. It entailed the driving of main entries through future coal territory to be mined for a distance of approximately six miles, with another two miles of main entry haulage from the mines. During the progress of construction it was not only necessary to build to the river, but it was also necessary to build away from the river, you might say backwards, in order to reach future, or what is now the present area where coal mining operations are being conducted.

Conveyor Installations Made Progressively

The operation was completed progressively by stages. The first stage was finished when we brought the coal through the hills to a highway one and a half miles from the river. From this point it was trucked to the river barges until such time as the remainder of the entry operations were completed for conveyor discharge at the river itself. This operation was started and carried on from two ways for the last 16,000 ft., and the entries upon completion or meeting were about an equal distance from each end under the hill, and they came together so perfectly that you cannot tell on the ribs where one entry ended and the other started.

Upon completion of the entire belt conveyor system, we found that we were no longer bothered with ice or snowy conditions on roads nor were we obliged to stop because of foggy conditions. The first two miles of this belt line, representing approximately one mile in each of the two mines, enters into a large tipple where the coal is picked by hand and reduced by a Marion Foundry and Machine crusher to a two-inch minus size and discharged into a large storage bin holding approximately 250 tons. From here it is continually fed onto the main river conveyor belt, which is approximately one mile long, where coal is discharged into another storage bin, which is also supplied by the three mines. Here the oversized coal is crushed to a 2-in. minus size and discharged into a large tipple or another storage bin of 250 tons capacity similar to the one previously mentioned. From this tipple the coal is conveyed to the river to our No. 7 tipple which contains a 250-ton capacity storage bin. The coal is loaded into 20-ton capacity gondolas equipped with automatic drop bottom dump. The loaded gondolas are pulled by a car hoist and endless cable and brought to the hopper and pass over a set of railroad scales and weighed on the move. The car is automatically dumped into a concrete pit which feeds coal onto a short conveyor belt to barges on the Muskingum River. We have found this operation to be an ideal way to transport coal. Well over a million tons of coal was transported over 8 miles of conveyor belt line in 1942 and we hope to transport more than one and a half million tons in 1943 and thereafter, providing the manpower situation permits. This entire conveyor belt installation is one of the longest in the domestic coal industry.

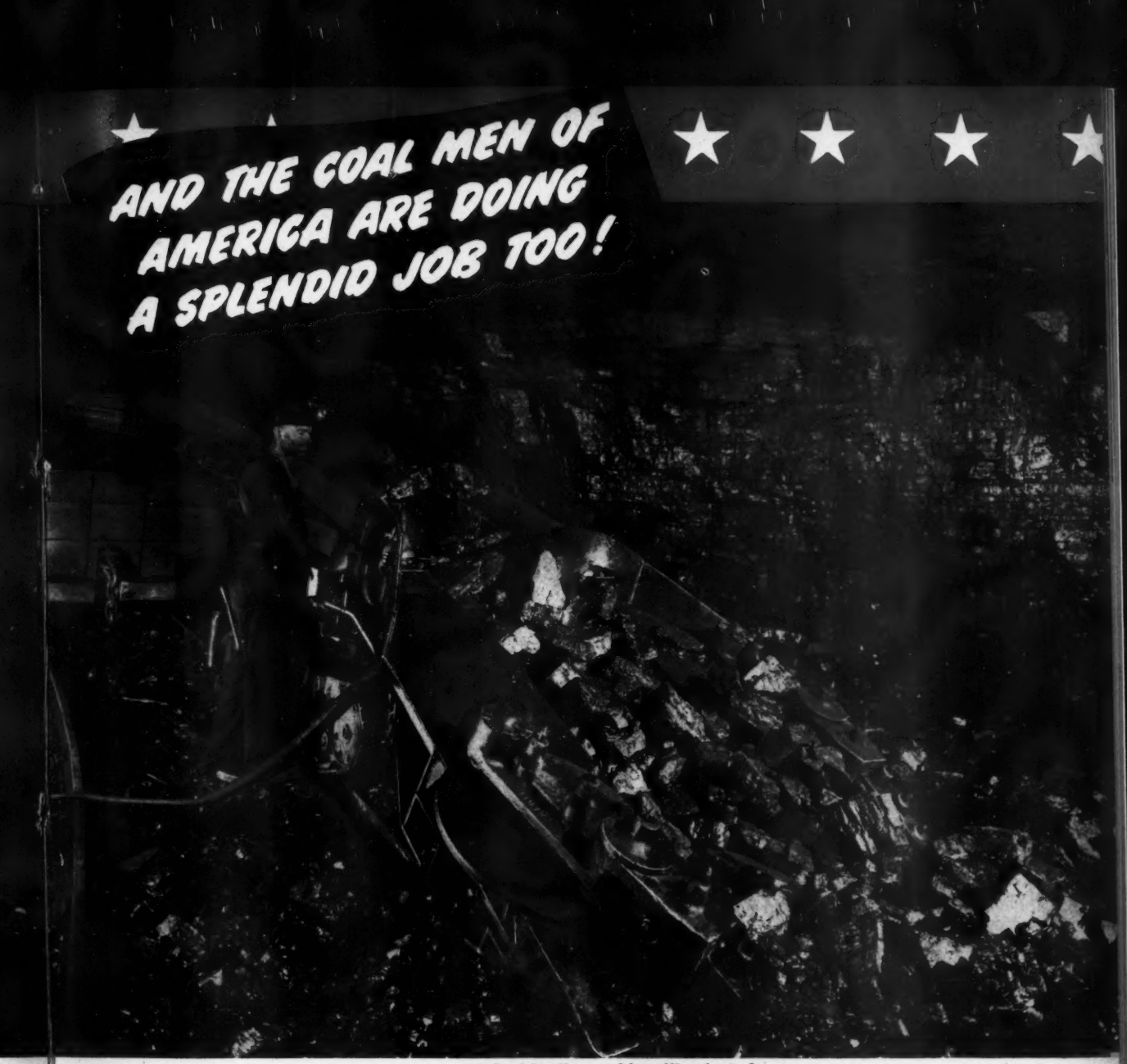
JOY Equipment keeps output up

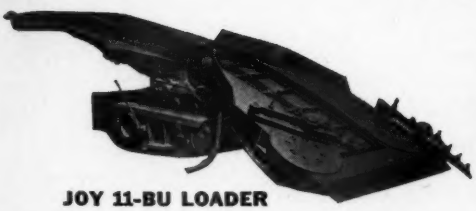
JOY Equipment keeps output up because every piece of JOY Mechanized Equipment—Loader, Shuttle Car or Conveyor—is carefully and exactingly engineered and fabricated to meet the specific needs and conditions of America's coal mines. That is the reason for the exceptionally low maintenance and the very high continuous operating ability of JOY Equipment—it is built to stand up—and it does stand up!

JOY 42-D SHUTTLE CAR
Permissible Type

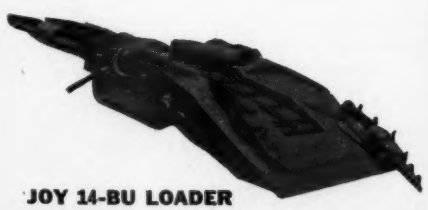
JOY 32-D SHUTTLE CAR
Permissible Type

AND THE COAL MEN OF AMERICA ARE DOING A SPLENDID JOB TOO!



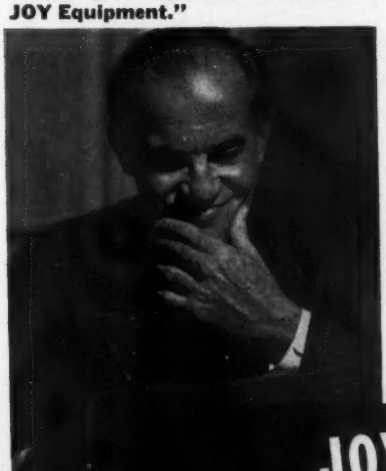


JOY 11-BU LOADER



JOY 14-BU LOADER

"Coal loading and handling is, today, a fast, simplified operation with modern JOY Equipment."



Call in a Joy Engineer to discuss your production problems

JOY
MANUFACTURING COMPANY
FRANKLIN, PA.

COAL MINE WAR CONFERENCE

Keynote of the program will strike at new and old problems which confront the industry in its task of producing a record coal output in 1943

AT CINCINNATI, Ohio, on May 17 and 18, men of the coal industry will meet in a War Conference to discuss ways of accomplishing the biggest job in the history of mining—the job of producing the greatest tonnage of any single material that has ever been taken from underground in one year. The key to production is men and machines, and the major consideration at this time is not so much systems or methods of mining and coal preparation, but rather how the problems of producing this record tonnage under wartime conditions can best be met.

Plans for the program are rapidly nearing completion, and subjects for the papers have been selected and arranged into sessions for the two days, as shown on the opposite page. Luncheon meetings will be held each day, and the Annual Dinner, with an address by a national figure, on Tuesday evening.

MANPOWER—A LEADING PROBLEM

A number of questions of paramount interest are to be discussed at the sessions: how mining personnel can be organized to overcome manpower shortages and utilize inexperienced men underground; how to prevent absenteeism; how to adjust maintenance practices so as to keep machines running at maximum time in spite of delays in supply and repair part deliveries; how to conserve material and to use substitute materials; how to maintain high standards of coal preparation and to supplement surface cleaning by removing impurities underground; how to conserve labor by reducing the amount of track work in the mine haulageways and by preventing slate falls; how to coordinate safety with the present high rate of mining and to train new men to work safely; how to reduce the coal dust hazard; how to remove overburden, how to construct haulage roads, and how to maintain electrical and mechanical facilities in strip mining; how to build up in the public mind a helpful, sympathetic attitude toward the bituminous and anthracite coal industry through a realization of the high fuel value of coal and an appreciation of what the industry has contributed to the war effort. The papers and discussions at the Conference will deal with these major problems.

One of the most pressing questions today is that of manpower and how the employment requirements for mining, as well as other essential industries, can be coordinated with the manpower requirements for the armed forces. The subject is one which taxes the best brains of industry and government, and calls for a high degree of cooperation between all concerned. The Monday morning session will be devoted entirely to a discussion of this problem. Fowler V. Harper, Deputy Chairman of the War Manpower Commission, will deliver the main address, and his remarks will be supplemented by Brigadier General William C. Rose, Chief of Executive Services, WMC.

Following these presentations, the meeting will be open for a full and free discussion in which operators from the various coal fields will outline the special problems in their own localities and the solutions that have been tried or proposed. The purpose of this session is to give to the industry the views of the War Manpower Commission and also to present from the industry a nation-wide picture of the problems which the coal mines are facing.

SPECIAL MEETING FOR MANUFACTURERS

On Monday Colonel A. Robert Ginsburgh, Chief of Industrial Service Division of the War Department, will speak from a background of 25 years' army experience on the progress of our armed forces and the materiel and transportation problems in several of the war theatres. On Tuesday, Howard I. Young, Director of Minerals Resources Coordinating Division of the War Production Board, and Arthur S. Knoizen, Director of WPB's Mining Equipment Division, will outline methods and procedure for obtaining mining equipment, material and supplies required for the coal industry's war production. In this connection, also there will be a special meeting on Tuesday afternoon, following the luncheon, for a manufacturers' forum with the WPB representatives on questions of allotments, scheduling of equipment, etc.

This annual gathering is the one occasion of the year when all branches of the coal industry can get together for a thorough exchange of ideas and serious discussion of their common problems. Executives and operating officials from all of the coal fields have advised that they will be on hand for this War Conference.

PRELIMINARY PROGRAM

MONDAY MORNING, MAY 17—GENERAL SESSION

Opening of Conference

The Manpower Problem

The Deputy Chairman of the War Manpower Commission will speak on the personnel situation in the coal industry: this will be followed by discussions from the floor.

MONDAY LUNCHEON

The Military Situation

Progress of our armed forces in the various theaters of war will be discussed by a ranking Army officer direct from War Department headquarters.

MONDAY AFTERNOON—DEEP MINING SESSION

Reducing Delays in Machine Operation

Maintenance practices adopted to overcome the loss of trained men, delays in supply delivery and the six-day week.

Organizing for Increased Production

Problems of management and meeting difficulties of supervision resulting from greater tonnage with decreased manpower.

Conservation of Labor

Saving man-hours in various phases of mining. Use of fabricated track material. Prevention of roof-falls and reduction of slate handling.

MONDAY AFTERNOON—STRIP MINING SESSION

Haulage Roads

Construction and maintenance practices with truck haulage from open pits, including road machinery and haulage equipment.

Electrical and Mechanical Maintenance in Wartime

New and old problems in keeping machines and power lines in condition for full-time production.

Electrical Controls on Late Model Shovels

Describing modern installations with Rototrol and Pilotrol.

MONDAY AFTERNOON—Annual Meeting Manufacturers Division, A.M.C.

TUESDAY MORNING, MAY 18—GENERAL SESSION

Quality Coal for War and Postwar Markets

Increasing coal utilization by maintaining high preparation standards—Recovering fuel values from refuse and sludge.

Public Relations

Creating in the public mind a more favorable attitude toward coal and gaining recognition of the industry's contribution to the war effort.

Conservation of Material

Methods used in various fields for rebuilding worn parts, reclaiming supplies, straightening rail and spikes, rethreading bolts.

TUESDAY LUNCHEON

Machinery and Equipment for Coal Mining

High-ranking officials of the War Production Board will discuss the industry's current problems of materials procurement.

TUESDAY AFTERNOON—DEEP MINING SESSION

Removing Seam Impurities Underground

Improving the quality of coal by selective mining and other methods of face preparation to supplement the surface cleaning plant.

Safety

Protecting against the hazards arising from high-pressure operation and preventing accidents to inexperienced employes.

Coal Dust Control Underground

A discussion of methods to allay coal dust underground in connection with the operations of cutting, loading and conveying.

TUESDAY AFTERNOON—STRIP MINING SESSION

Moving Overburden with Small Draglines

Operations with equipment of from three to nine cu. yds. capacity.

Moving Overburden with Large Draglines

Operations with high capacity equipment of from ten to twenty-five cu. yds.

Speakers for all of the above listed subjects will be announced in the near future.

TUESDAY AFTERNOON—Special Meeting of Manufacturers on Allotments and Scheduling of Equipment

TUESDAY EVENING—Annual Dinner.

Converting a Gold Mining Enterprise for the War Program

The Golden Cycle Corporation in Colorado, operator of the largest gold recovery plant in the country, has mobilized its engineering talent for the production of war metals. Output from several zinc-lead mines in the state will now be treated in the company's mill.

By MERRILL E. SHOUP
President
Golden Cycle Corporation

THE IMPACT of war has changed many things during the last year—among them, the mining industry views the plight of many isolated gold mining camps, some of which are operating on a curtailed basis, whereas others in remote regions are completely shut down. Gold mining in the famous old Cripple Creek district in Colorado is on a much reduced scale, but it's the siliceous ore from the district which today plays an important part in the change brought about by the war in the mining operations of the Golden Cycle Corporation of Colorado Springs. Mining activity in peace-time by this company's numerous operations revolved around the production of gold. Today the facilities have been converted to supplying the war program with zinc, lead and other essential products for war use.

A list of the corporation's operations include the Golden Cycle mill, located in Colorado Springs; The Midland Terminal Railway Company, operating from Colorado Springs to Cripple Creek; coal mines located north of Colorado Springs and south of Florence, Colo.; and its allied gold mining companies, including The United Gold Mines Company, The Cresson Consolidated Gold Mining & Milling Company, and other gold mine operations located in the Cripple Creek Mining District. All these companies have done an outstanding job in converting their production for the war effort.

The necessary planning and work involved for the conversion was under way when the Gold Mining Closing Order L-208 of the War Production Board was issued on October 7, 1942, which required the closing of all non-essential gold mines on December 8, 1942.

Undertaking the Treatment of Zinc-Lead Ores

The Golden Cycle Corporation owns and operates the largest custom gold mill in the United States, including Alaska. The conversion of the flotation section of the mill has now been completed and the mill has started the treatment of zinc-lead ores. The total capacity of the converted section is from 450 to 500 tons per day. This capacity will be gradually increased as the output of custom zinc-lead ore from mines in the state continues to rise.

From 1929-1939, the Golden Cycle mill maintained lead-zinc recovery

The famous Cresson mine and its machine shop in Cripple Creek, Colorado, have gone to war

The Golden Cycle Mill, the largest gold milling plant in the country, is now a producer of zinc-lead concentrates for the war program

operations, but this was abandoned in 1939 when the plant was changed. The company is now purchasing base metal ores in Colorado and every effort is being made to encourage mine output in the districts which will supply most of the zinc ore for the mill. These districts in Colorado are the Bonanza, in the vicinity of Villa Grove, Boulder, Clear Creek and Gilpin Counties, the Breckenridge District, and the territory located around Leadville and Lake County.

It is hoped that sufficient tonnage of zinc-lead ores can be secured to keep the mill running at capacity. The new mine quotas and prices recently announced for zinc-lead mining should stimulate the production of these metals in the Colorado mines.

Zinc concentrates produced by the Golden Cycle plant will be shipped either to Amarillo or Dumas, Texas, or a part to the electrolytic zinc plant of Anaconda Copper Mining Company at Great Falls, Mont. The lead concentrate will be shipped to the smelter of the American Smelting and Refining plant at Leadville, Colo.

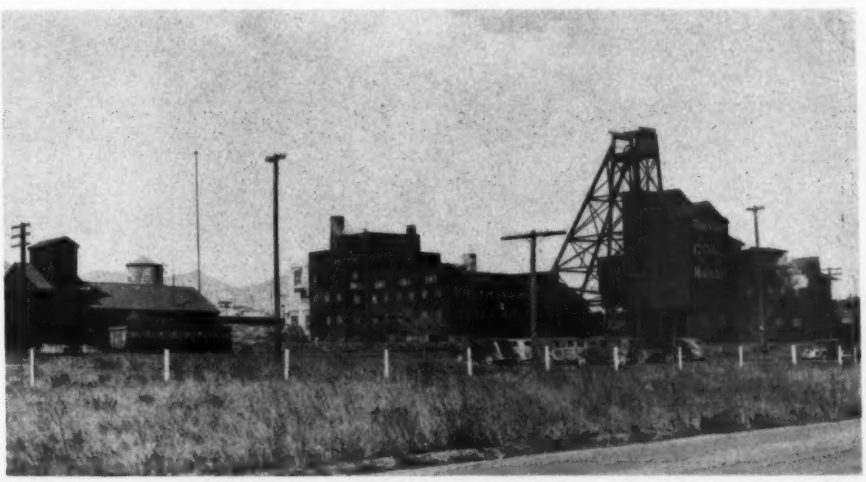
In order to properly treat the zinc-lead ores it is necessary to have a sufficient volume of siliceous ore constantly available and going through the mill. The gold mines of the Cripple Creek District, now operating on a curtailed basis, is the only nearby source of this siliceous ore.

At the present time, The Golden Cycle Corporation is contemplating taking over the operation of several properties producing lead-zinc ores in order to assure a steady flow of tonnage, thereby avoiding any possible delays due to ore shortage.

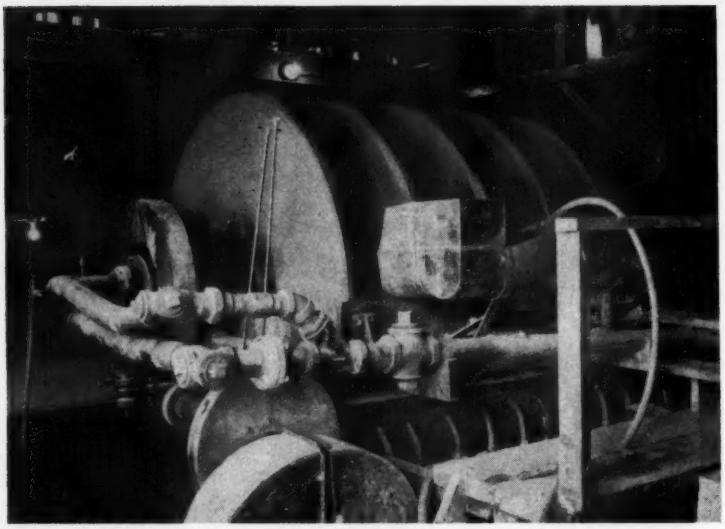
The Golden Cycle Mill will also handle the bulk of the concentrates produced by the Ore and Chemical Company's sink and float plant which is now being erected near Leadville. The sink and float plant will treat chiefly dumps in the old Leadville District and will have a capacity of 1,000 tons per day.

Cripple Creek Machine Shops Produce War Items

The machine shops of The Cresson Consolidated Gold Mining and Milling Company, The United Gold Mines Company and The Golden Cycle Corporation, located in the Cripple Creek Mining District, are already at work on the production of war items which can be made by the existing equipment in the plants. Items which already are being produced and which shortly are to be brought into production include winches for ships, fittings for aircraft and other similar items. It is hoped that sufficient war contracts will be secured to keep the machine shops in the Cripple Creek District operating 24 hours a day.



The Pikes Peak Coal Company, a subsidiary of the Golden Cycle Corporation, supplies coal for the plants producing electric power for various industrial enterprises



American leaf-type filter for handling zinc concentrates in the Golden Cycle Mill

A contract has been entered into with the Rock Island Railroad to produce badly needed ballast for the maintenance of its rail lines running east from Denver and Colorado Springs to Chicago. The United Gold Mines Company operates a large pit located 32 miles west of Colorado Springs to produce this ballast. The rock will be transported by The Midland Terminal Railway Company to the junction of the Midland Terminal and the Rock Island Railroads at Colorado Springs, and thence transported east by the Rock Island to be used on its main lines running east from Denver and Colorado Springs to Chicago.

This ballast is decomposed Pike's Peak granite and is regarded as one of the best types of crushed rock suitable for use by the railroads of the country. Production from this pit started on April 1 and will amount to many thousands of tons during the coming season.

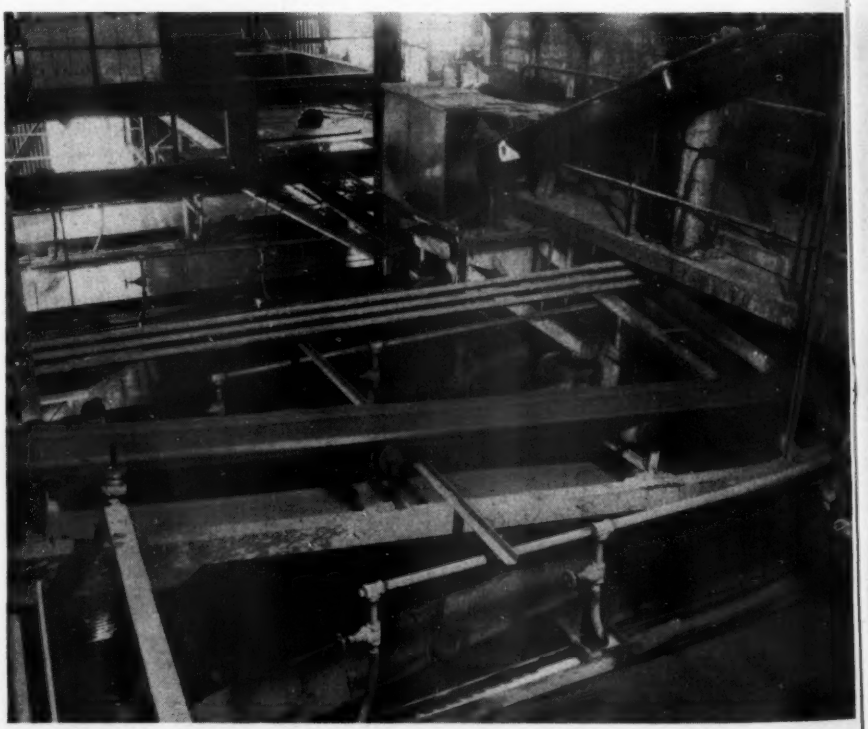
Coal Mines Provide Power for the District

The Golden Cycle Corporation owns one of the largest lignite coal mines in the State of Colorado which is located approximately 7 miles north of Colorado Springs. In this connection it owns and operates a power plant situated at one of its coal mines. In order to handle its wartime needs of electric power, it was necessary for the city of Colorado Springs to have a standby power capacity available in addition to its municipal power plant. This requirement will be fulfilled at the expense of The Golden Cycle Corporation by greatly increasing the capacity of its power plant at one of its coal mines near the city. The generating capacity of the coal mine power plant, when completed, will be 8,750 to 9,000 kwh. The existing plant furnishes power to the Golden Cycle mill, to the coal mines, and soon will serve as a standby plant for Colorado Springs. The coal mine produces from 200,000 to 225,000 tons of coal per year. At the present time The Golden Cycle Corporation is also supplying coal to important defense centers. Every effort is now being made to increase the production of the company's coal property in order to take care of growing war needs. Two new boilers are now being installed at the company's Pikeview coal mine.

Crushing Plant Makes Aggregate For Many Projects

The United Gold Mines Company has a crushing plant located in the Cripple Creek Mining District. This plant crushes rock from mine waste dumps into sizes appropriate for use in mixing aggregates for making foundations, etc., for various war construction jobs. During the past year many thousands of tons of this material have been furnished and a steady demand continues. The rock is transported by The Midland Terminal Railway Company to Colorado Springs and thence transshipped to the various projects. The shops of The Midland Terminal Railway Company, located in West Colorado Springs, have for the last couple of years turned out in their machine shops parts needed for other war industry plants.

Thus has the energies, talents and employes of a large gold mining company with diversified interests been converted to help win the war.



Wilfley tables in flotation section where zinc and lead ore are being concentrated in the Golden Cycle Mill, Colorado Springs

Short-Cut Method of Determining Induction Motor Horsepower from Ammeter Readings

By JOSEPH A. SETTER
Industrial Department
General Electric Company, Denver, Colo.

WITH THE accelerated pace of the war production program, many machines and factories are now working around the clock. This means in many instances that some machines are being loaded with heavier production schedules than they were originally designed for, while others are underloaded. Too, the great demands for new machinery have led to the installation of much used equipment which in many cases is overmotored in relation to the immediate job.

It is a well-known fact that underloaded induction motors operate at very poor power factor and draw an excessive amount of lagging current. This in turn wastes vitally needed power in all feeders and in distribution equipment clear back to the generating station power.

Frequently these difficulties can be overcome by checking the load and, on the basis of such a check, switching motors on some of the machines to improve the load factor. The purpose of this article is to present a simple method whereby loading on integral-horsepower induction motors can be determined with practical accuracy by means of a hook-on volt-ammeter.

This method is of unknown origin but has been used with practical results by several plant electricians for a number of years, and has been checked for accuracy with design data of motors. With this method it is not necessary to lose productive time, because the leads to the motor need not be disconnected to make the tests.

Here are the seven simple steps to be taken in using this method:

1. Plot a chart with "percent hp." against "percent full-load amperes" for each motor.

2. Locate point A as 100 percent from motor nameplate reading of amperes at rated hp. of motor. (Also it is assumed that the nameplate voltage is maintained.)

3. Disconnect motor from load and read no-load amperes with ammeter and locate point C in percent of full load current (approximately 25 to 45 percent depending on speed of motor).

4. Locate point D halfway between O and C and draw line DA.

5. Locate point B on line DA at 50 percent of the motor hp. rating and draw CB.

6. Then line ABC will be the approximate curve of the percent horsepower output of the motor plotted against percent of motor current.

7. For any motor current, read in amperes, calculate the percentage of the full-load current, follow horizontally until line ABC is intersected. Then drop down vertically and read the percent load of the rated hp. of the motor.

If it is not convenient or feasible to disconnect the motor from the load as suggested in Step 3, then the no-load current can be taken from Fig. 1. For example, an 1800-r.p.m. motor has a no-load current of approximately 25 percent which is the average for motors up to 100 hp. Lower speed motors have higher no-load currents, in the order of 45 percent of full-load current for 600-r.p.m. motors.

It may be surprising to find that the no-load currents are as high as that shown in Fig. 1, but it should be remembered that the no-load current is nearly all magnetizing current at practically zero lagging power factor and that the actual horsepower input from the power system is very low. This accounts for the rather high currents below one-half load where the efficiency of the motor is also lower.

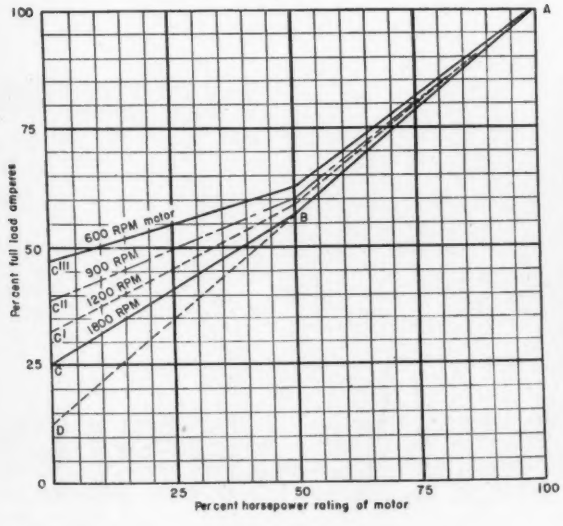
From one-half to full load, it can be seen that the motor current is roughly proportional to horsepower output because both efficiency and power factor are higher and more nearly constant.

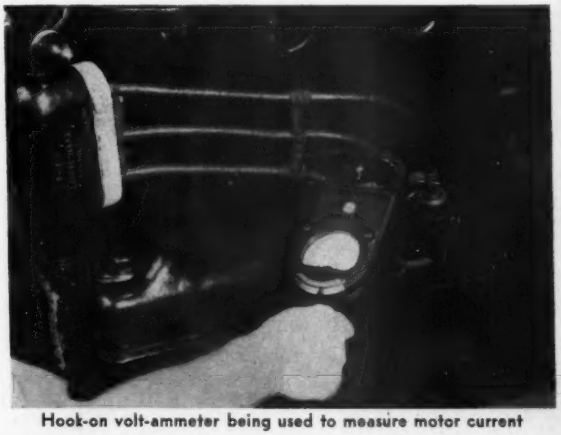
Thus we have a timely, practical, and time-saving way to determine the horsepower that an a-c motor is delivering just from an ammeter reading. Accuracy of between 2 and 3 percent can be expected, subject of course to the ammeter accuracy tolerance.

Another advantage to be obtained by the hook-on volt-ammeter is that the voltage applied to the motor can be read simultaneously with the current. It is obvious that a motor must have the proper voltage applied or the current will be too high and overheating will result. This will also give an indication of the loads on feeder copper so that remedies can be applied.

It is hoped that this method will serve as an additional tool to help in the war program of utilizing all materials to the best advantage. Proper motoring is a patriotic necessity to conserve vital materials. Overmotoring is a tacit admission of insufficient knowledge of the machine and during wartime it is almost a crime. We should err on the side of reasonable overloading to get maximum use of the motor horsepower available to produce victory.

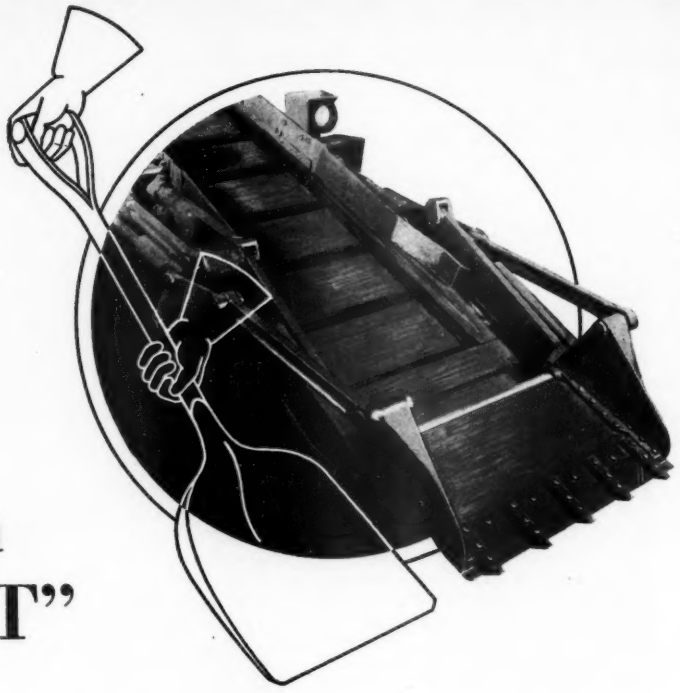
Fig. 1





Hook-on volt-ammeter being used to measure motor current

If He Can Use A Shovel— He Can Operate An "AUTOMAT"



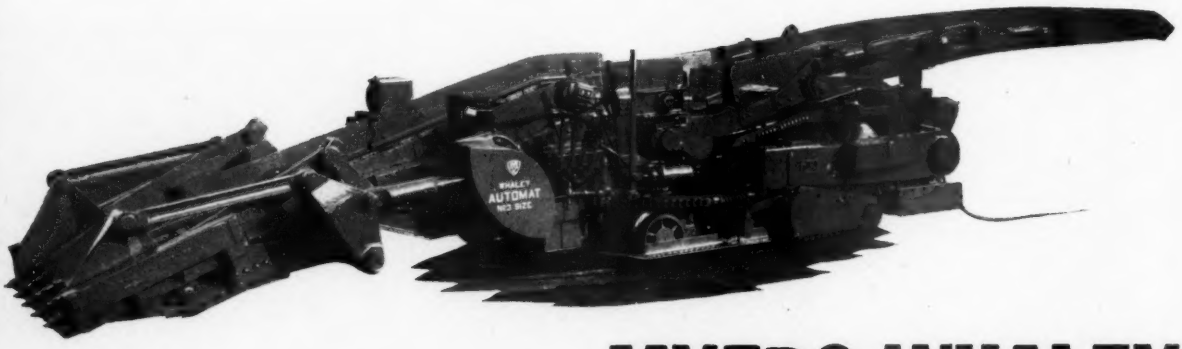
★ If those younger men you have depended upon to operate your loaders, in your mechanization plan, are leaving for the fighting front, you need the "Automat" more than ever. You need it because of its smooth and easy operation . . . because any one of those good, steady men—men who have been with you so long—can satisfactorily operate the "Automat" with complete safety.

If he can use an ordinary hand shovel, he can, with average intelligence, operate an "Automat." Only the touch of a lever is necessary to guide its action. Even in the hardest kind of service, there is no jerking, side kicking or danger of being caught between machine and ribs or timber. This is due to the "Automat's" exclusive shoveling action, working in the vertical plane.

The Whaley "Automat" is not only a man-power saver but because of its ease of operation and the slight manual effort required to run it, the "Automat" is an energy saver as well.

Give that dependable man of long service an opportunity. He may not be a mechanic . . . he may not be a model of physical perfection, but 9 to 1 he will get you the big production that the "Automat" is capable of.

Myers-Whaley Company, Knoxville, Tennessee



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Mine Roof Sealing To Prevent Slate Falls

A Preliminary Report by the Coal Division Committee on Roof Action

THE REPORT presented here covers a roof sealing project in a territory adjacent to the bottom of a new air shaft, which will serve as an intake and outlet for the section to be mined. It was found that the roof in these entries, which are driven 12 ft. wide, had a tendency to start falling shortly after exposure, apparently as a result of weathering more than as a result of structural weakness. Generally, these roof falls were small, but frequent, especially in periods of warm, moist weather. Ordinary timbering methods were not particularly satisfactory inasmuch as the material tended to fall in small pieces and over a period of time would fall out around the timber sets. Not only did this condition interfere with haulage, but, because of the character of the overlying strata, the falls would, unless checked, continue upward until the air course entries were choked.

This account of an actual roof sealing project, was made through the courtesy of a coal mining company who cooperated in furnishing data and also permitted the Committee to make an underground inspection of the roof condition and the methods of applying the coating. No conclusions on the final result can yet be formed, but in the belief that roof sealing offers a practical solution to the prevention of certain types of slate falls, this report is presented to encourage a scientific approach to the problem

On the basis of observations of this roof, it was decided that it might be possible to prevent the falls through the application of mine roof sealing material. In order to determine if laboratory tests would be useful in predicting whether sealing might be successful with the particular strata involved, samples of the roof were collected and sent to Dr. Paul H. Price, state geologist of West Virginia for analysis.* Accompanying these samples were pertinent data concerning the roof and general mining conditions and the results of the tests made on three samples of the roof rock were furnished to the committee as given in the following extract.

* The mineralogy analysis on these samples was done by Dr. J. H. C. Martens and the chemical work by Dr. A. J. W. Headlee; both with the West Virginia Geological Survey.

Fig. 1. The sealing coat, applied to the roof and to the exposed rock strata in the ribs, is extended back into the breakthroughs

Mineralogical Examination and Slaking Tests of Roof Shale Samples

This mine is operating the room and pillar system in the Pittsburgh seam which dips southeast 1.0 to 1.5 per cent. The geologic disturbance has been mild with occasional clay dikes extending into but seldom through the coal. The face and butt cleats are well developed at an angle of N-68°W and N-22°E, respectively; the face cleats are frequently separated by calcite (crystalline limestone) flakes. The fixed carbon (dry, mineral matter free basis) is slightly less than 60. A typical section of the

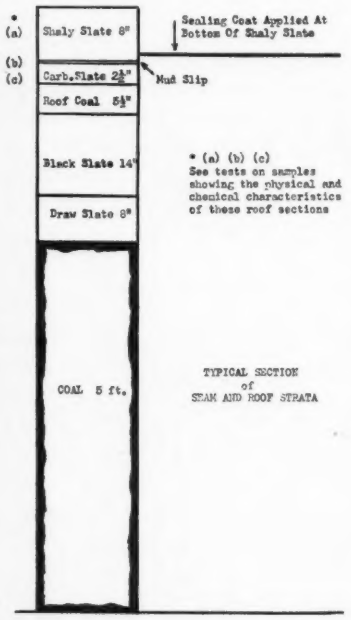
(a)
Shaly Slate 8"
Sealing Coat Applied At Bottom Of Shaly Slate
(b)
(c)
Carb. Slate 2½"
Mud Slip
Roof Coal 5½"
Black Slate 14"
* (a) (b) (c) See tests on samples showing the physical and chemical characteristics of these roof sections
Draw Slate 8"
COAL 5 ft.
TYPICAL SECTION of SEAM AND ROOF STRATA

Fig. 2—Characteristic seam and roof strata

seam and immediate roof strata is shown in Fig. 2.

Falls.—The third section from the top (carbonaceous shale marked C) begins to fall two or three weeks after mining at an intermittent rate of from a few pieces to several tons. The particles of rock are irregular in size and shape. The falls are much more frequent in summer than in the winter. The top section (shaly slate marked A), stays up for several months after mining depending on local conditions. It falls intermittently in flat thin pieces up to several feet in length and width, and usually from ½ to 2 in. thick. The rock parts along the bedding plane.

Mineralogy of Samples.—Three samples were collected: sample No. 1 was a one-gallon can of pieces of carbonaceous shale (section C), sample

TABLE I

Appearance of rock after boiling	Grams of Solid in suspension	Appearance of Suspension	Time of Settling
Sample No. 1—(Sec. C) Mostly unaltered—white crystals of gypsum on rock after water evaporated.	.078	Black	1 Hr. 50 Min.
Sample No. 2—(Sec. A) Unaltered—few gypsum crystals on rock after water evaporated.	.041	Slightly opaque	1 Hr. 30 Min.
Sample No. 3—Below mud slip—(Sec. C) Broke up into ¼-in. pieces fairly uniform in size.	.060	White opaque	¾ clear after 2 Hrs. Slightly turbid after 13 days.
Above Mud slip.—(Sec. A)—Unaltered.	.012	Almost clear	23 Min.

No. 2 was a one-gallon can of pieces of shaly slate (section A), and sample No. 3 was a large piece (approximately 30 lb.) of sections A, B and C. Detailed descriptions of these samples are given in the accompanying data sheets and the weathering tests are tabulated in Table 1.

The carbonaceous shale (sample No. 1) immediately below "mud slip" is a very dark gray shale with thin streaks of black coaly material. It is not quite so dark in color as sample No. 2 and is not so distinctly laminated. It contains a little pyrite associated with the coaly material. A few of the surfaces of the fragments show iron stains (iron rust) and small amounts of secondary gypsum (calcium sulphate which has been formed after the rocks were exposed to the air).

The shaly slate (sample No. 2) overlying the mud slip is a distinctly laminated, black, carbonaceous shale with thin streaks of coal. A few fragments have a very slight amount of iron stains and coatings of very small gypsum crystals. Pyrite seems to be present in very small quantities.

The large piece (sample No. 3) showing contact between sections A and C, was broken into several hun-

Description of Sample No. 1

Sample of: Carbonaceous shale (Section C) underlying the mud slip.
Method of Sampling: Bench sample ¾ gallon removed from place, placed immediately into one-gallon can and sealed.
Location in Mine: 300 ft. from shaft bottom, 40 ft. from overcast—intake air.
Sampling Face: Moist—approximately 1 year since coal was mined.
Presence of Oxide (brown iron stains) Minerals: None noticed.
Presence of Sulphate (efflorescent) Minerals: None noticed.

ROOF CONDITION (Structure)

Stratification: This particular sample is a horizontally bedded carbonaceous shale but breaks irregularly.
Concretions (coal balls): None noticed.
Fossils: None noticed.
Jointing and Fracture System of Coal: Compass direction of butt cleats N-22° E.; face cleats N-68° W. Bottom rolls in coal. Butts and faces are vertical.
Description of Fracture System (joints or breaks and faults): Roof breaks are generally irregular. In some parts of Western Pennsylvania the line of fracture in the roof rocks is parallel to the butt cleat of the coal. This is not known to be true for this mine.

ROOF FALLS (Associated with material sampled)

Time after Mining: 2 to 3 weeks in August—longer in fall and winter.
Rate: Intermittent.
Amount: From few pieces to several tons daily; more frequent in summer, seasonal variation in this area.
Are falls equally common regardless of direction of mining? Little experience to date.
Particle: Irregular size, sharp angular fractures.
Remarks: Deterioration of roof progresses much more rapidly in summer due to more moisture being precipitated.

Description of Sample No. 2

Sample of: Shaly slate (Section A) overlying the mud slip. This rock is intended for the mine roof if spalling stops at this point.
Method of Sampling: 1 gallon size by chipping a section from top section approximately 2 in. in thickness.
Location in Mine: Return air course about 50 ft. from up cast.
Sampling Face: Wet; 1½ years since coal was mined.
Presence of Oxide (brown iron stains) Minerals: Iron stains present on roof slate.
Presence of Sulphate (efflorescent) Minerals: None noticed.

ROOF CONDITION (Structure)

Stratification: This particular sample is horizontally bedded and falls in flat pieces of all shapes—known as checkered roof.
Concretions (coal balls): None noticed.
Fossils: None noticed.
Jointing and Fracture System of Coal: Compass direction of butt cleats N-22° E.; face cleats N-68° W. Bottom rolls in coal. Butts and faces are vertical.
Description of Fracture System (joints or breaks and faults): Roof breaks are generally irregular. In some parts of Western Pennsylvania the line of fracture on roof rocks is parallel to butt cleat of the coal but this is not known to be true for this mine.

ROOF FALLS (Associated with material sampled)

Time after Mining: Stays up for several months depending on coal conditions.
Rate: Intermittent.
Are falls equally common regardless of direction of mining: Unknown.
Particle: Flat pieces up to several feet in length or width usually from ½ to 2 in. in thickness some cases. Known as checkered roof.

Description of Sample No. 3

Sample of: Three strata (Sections A, B and C) above roof coal: shaly slate, mud slip and carbonaceous shale.
Method of Sampling: Piece 15 in. x 10 in. x 10 in. removed as one piece from exposed section.
Location in Mine: No. 3 butt—alongside an overcast.
Sampling Face: Moist; approximately 1 year since coal mined.
Presence of Oxide (brown iron stains) Minerals: Yes.
Presence of Sulphate (efflorescent) Minerals: None noticed.

ROOF CONDITION (Structure)

Stratification: This particular sample has irregular fracture with sharp angular pieces.
Concretions (coal balls): None noticed.
Fossils: None noticed.
Jointing and Fracture System of Coal: Compass direction of butt cleats N-22° E.; face cleats N-68° W. Bottom rolls in coal. Butts and faces are vertical.
Description of Fracture System (joints or breaks and faults): Roof breaks are generally irregular. In some parts of Western Pennsylvania the line of fracture of roof rocks is parallel to the butt cleat of the coal but this is not known to be true of this mine.

ROOF FALLS (Associated with material sampled)

Time after Mining: Irregular.
Rate: Intermittent.
Amount: Irregular.

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dred pieces when received in the laboratory. The upper portion designated as "shaly slate" is black and contains a large proportion of coal in very thin streaks. There are some plant remains flattened out along bedding planes and partly pyritized. The part designated as "mud slip" is not recognized as a layer of any distinct type of material, but seems to be the bedding plane separating the more highly carbonaceous and laminated shale above from the shale below. Pyrite is fairly abundant in association with carbonaceous material of the upper layer, of this sample (section A), both in thin streaks parallel to the bedding and in small disseminated grains. There are some *limonite* (brown — Hydrous Ferric Oxide) stains from alteration of the pyrite, and many of the surfaces running botb parallel to and across the bedding planes have small flat gypsum crystals on them. These have been formed since the exposure of the rock in mining operations. Microscopic examination of the gray shale from the lower part of this specimen (section C) shows that it has a very fine texture. Nearly all of it has a refractive index above 1.54 which means that little if any *montmorillonite* (a very fine textured clay which slakes readily) can be present. It is probably a mixture of *kaolinite* and the potash bearing clay mineral closely related to *muscovite*. There are a very few small angular grains of quartz, but not enough so that the shale could be described as silty.

Weathering Tests on Samples.—One hundred gram samples consisting of only a few pieces were boiled in water for five hours. The water was quickly poured off and the time of settling and the quantity of suspended matter was determined, as shown in Table I:

These shales did not disintegrate readily with the possible exception of the lower section of sample No. 3, which accounts for its breaking up while in transit to the laboratory. The dark shale overlying the mud slip definitely is less affected by weathering than the gray shale below and will make the better top. The walls and roof show plenty of iron oxide and gypsum stains as a result of the oxidation of pyrite and other oxidizable iron minerals. Sample No. 2 contains slightly more oxidizable material than sample No. 1.

Conclusions from Sample Examinations.—Tightly sealing this roof should prevent the slaking of the shale, as well as the oxidation of the iron compounds, which will materially aid the stability of this roof. Since the top breaks readily for long distances along the bedding plane, the roof should be painted well back into the entries off the haulage way. Also boreholes in the top should be tightly sealed. The paint should extend for a foot or more down the walls. The roof should be regularly inspected and repaired after sealing because maintenance will be necessary in order to keep the roof sealed.

Committee Inspection

Since the foregoing report indicated that sealing would, in all probability, control the spalling of this roof, the company proceeded with the work of applying mine roof sealing material in intake air courses. As recommended, it was decided to seal the "shaly slate" (section A) and take down all material below the mud slip and in order to assure protection, to extend the sealing coat down the ribs to slightly below the top of the coal. (See Figs. 1 and 4.)

The roof was carefully scaled to the "shaly slate" only a little in advance of the application of the sealing material in order that the roof need be exposed no more than the least possible length of time. The sealing material, is an asphalt paint with a high percentage of gilsonite and micalite filler; this is applied by spraying at about 70 lb. pressure per

sq. in. and the resulting covering, about 1/16 in. thick, hardens in a relatively short time.

An inspection of the work after completion made by the committee in February, 1943, clearly indicated that spraying alone would not provide a sufficiently complete seal. Some touching up by hand must of necessity be done immediately after spraying. Small irregularities in the roof do not get the full effect of the spray and cracks are sometimes left exposed. These would absorb water in a very short time and scaling off of small pieces would follow. Moreover, it was discovered that some small pieces of sealed roof came down even though apparently well covered by the original application of paint; these instances were, however, quite infrequent, indicating that the work of scaling in advance of spraying had been well done. It is, however, evident that a certain amount of follow-up of the spraying must be done to make an effective "watertight" seal and in addition, present indications are that some maintenance work will always be necessary. Small patches of roof may fall and the exposed rock, unless scaled and recoated as soon as discovered, can spread until the seal is broken to such an extent as to be ineffective.

Fig. 3—A typical view of untreated roof, showing the initial stage of roof spalling

In the present case, the material was applied in cold, dry weather. For that reason, conditions were good both with respect to keeping out moisture before it had an opportunity to be absorbed in the cracks of the roof material, and from the standpoint of relatively fast drying of the sealing material. The acid test of the efficacy of the seal will come in the months when temperature and relative humidity are high and moisture is being carried into the mine.

It is expected that a further progress report of this and other installations will be made after this roof has been exposed to varying atmospheric conditions over a longer period.

Submitted February, 1943, by Committee on Roof Action.

FRANK G. SMITH,
Chairman.
H. P. GREENWALD,
A. E. LONG,
W. D. NORTHOVER,
DR. P. H. PRICE,
A. E. SPOTTI,
JEROME WHITE.

Fig. 4—A haulway with the coating on the roof and also covering the exposed top rock down to the coal seam

Wheels of Government

As Viewed by A. W. Dickinson of the American Mining Congress

IN RECENT WEEKS the movement of the legislative program has been so slow as to arouse concern among administration chiefs over the enactment of a number of important measures. In addition to the withholding tax bill, which has been a distinct embarrassment to the leaders, action is pending on extension of the authority to negotiate foreign trade agreements, which expires June 12; on the President's powers over dollar devaluation and the $2 billion stabilization fund, as well as problems of post-war stabilization; on farm price difficulties, and on the question of what is to be done with the National Bituminous Coal Act which expires April 26.

Returning from a White House conference, Senate Finance Committee Chairman Walter George, widely regarded as a most able statesman, discussed the controversial problem of extending the foreign trade agreement authority against which there is known to be definite resistance on the part of northern and western members of Congress. Consideration was given to alternative compromise proposals, (1) to make the foreign trade agreements subject to veto by concurrent resolution of the House and Senate, or (2) to limit extension of the authorization to one or possibly two years.

"The Mountain Labored"

Keen disappointment on the part of minority members of the Ways and Means Committee over the withholding tax bill reported after many weeks of effort, was voiced by one member who said that "the mountain has labored and brought forth a mouse." In addition to some concessions made to the armed services, the bill provided merely for a 20 percent withholding tax beginning July 1, as a means of collection against existing taxes on individual incomes. The ignominious recommitment of the bill after stormy floor debate was preceded by a vote of 199 to 188 endorsing the widely discussed Ruml plan, which was quickly reversed however by a vote of 215 to 198. The vote by which the bill was recommitted was 248 to 168. Compromise measures are being discussed which would grant a partial tax-abatement such as the plan of Committeeman A. Willis Robertson of Virginia, to abate the 6 percent normal and 13 percent first bracket surtax on 1942 incomes of all taxpayers; also the previous proposal of Chairman Doughton that half the 1942 liability of each taxpayer be cancelled.

Credit is due to Representative Wesley Disney of Oklahoma, for his work in repealing the Executive Order placing a limit on salaries. As amended by the Senate and enacted, no salaries or wages may be reduced below the highest level they reached between January 1 and September 15, 1942. The limitation rider was enacted as a part of the bill authorizing increase in the national debt to $210 billion. It reflected the resentment of Congress against an Executive action taken contrary to the definitely expressed will of the legislative body.

Also quickly made into law was the measure postponing from April 21 to September 16 the time for corporations to apply for relief under provisions of the excess profits tax law.

Renegotiation Exemptions

Natural resource materials of 32 major classes have been exempted from contract renegotiation under joint regulations issued by the War and Navy Departments, Maritime Commission and Treasury Procurement Division. Following the language of the statute, as adopted after discussions with mining representatives in the fall of 1942, the regulation states that each of the products exempted is "the product of a mine, oil or gas well, or other mineral or natural deposit, or timber, which has not been processed, refined, or treated beyond the first form or state suitable for industrial use." It is further provided that when one of the exempt products is included in the manufacture of another product which is not exempt from renegotiation, the exempt product will be allowed as a cost in the performance of the contract (covering the non-exempt product) at the sale or market price of such exempt product.

Absenteeism and Anti-Strike

Most constructive action on absenteeism has come from the House Com-

Washington Highlights

LEGISLATIVE PROGRAM: Moving at snail's pace.

WITHHOLDING TAX: Routed by Ruml backers.

SALARY LIMITATION: Sprung by Disney of Oklahoma.

RENEGOTIATION: 32 natural resource materials exempt.

ABSENTEEISM: Data wanted for Draft Boards.

"LITTLE STEEL" FORMULA: The proverbial football.

SUPERVISORY EMPLOYES: Smith Bill would protect them from unions.

COAL WAGE CONTRACT: Negotiations proceeding.

P-56 REVISED: Now dovetailed to CMP.

HEARINGS ON SMALL BUSINESS: From Washington, D. C., to Grant's Pass, Oreg.

ASSISTANCE TO SMALL MINES: Howard Young tells Senate of aid given.

mittee on Naval Affairs which has reported a bill introduced by Rep. Lyndon B. Johnson, of Texas. This measure would cause the Navy and War Departments, U. S. Maritime Commission and War Shipping Administration, together with their contractors, subcontractors and producers of materials, to keep and to furnish complete records on absenteeism to the Labor Department's Bureau of Labor Statistics and also to local draft boards when requesting deferments from military service. The coverage of this bill is very broad.

The House Committee on Military Affairs is conducting hearings on the bill by Rep. Howard W. Smith of Virginia, which invokes action by local draft boards under the Selective Service Act to maintain discipline in the operation of mining, agricultural, manufacturing, construction and distribution industries. Particularly stressed in the bill is the point that supervisory employes shall not be eligible for membership in any labor organization engaged in collective bargaining with a "war contractor." In giving testimony on the bill President C. E. Wilson of General Motors Corp., stated that "it is fundamental that a man cannot serve two masters" and that with plant discipline seriously jeopardized mass production for war "might deteriorate into mob production."

Quite heated was the exchange between members of the Truman Senate War Investigating Committee and UMW leader John Lewis late in March when the committee members pressed questions concerning Lewis' attitude on the no-strike agreement of December, 1941. A formal report issued by the committee takes sharp issue with Lewis' statement that the agreement is not "necessarily binding" and charges that "labor has come of age and the country expects these leaders to recognize that labor has duties as well as rights." Tone of the report is softened by a later statement that the government and labor alike should consider wage increases in a judicial and realistic manner, and that the committee does not consider the "Little Steel" formula as sacred or closed to discussion.

Coal Wage Contracts

Extended to April 30, the negotiations of the Appalachian Wage Conferences, both North and South, are grinding on in New York. Anthracite operators and miners, whose contract expires April 30, are also negotiating. Demands of the miners, beginning with a $2 a day increase and a minimum wage of $8, include the unionization of all employes below the rank of superintendent (clerks, engineers, foremen, etc.); a one-year contract with a 30-day cancellation clause; a portal-to-portal working shift; double time for Sunday; elimination of differentials between districts; elimination of third shift mining; abolition of six-day week at end of war emergency; operators to handle the cars to and from working faces; furnishing of union-made explosives, mine supplies and tools; no charge for safety equipment and devices, including electric cap lamp rentals; day and monthly men furnished tools and equipment without charge; no charge for blacksmithing; work-week to begin on Monday and be designated in the agreement; and compensation payment for vacation to be increased from the present $20 token payment to $50.

Chief Department of Labor Conciliator John Steelman is spending most of his time in New York with the negotiators and the War Department Labor Specialist Edward F. McGrady is reported to be maintaining intimate field contact with the entire situation.

In the meantime the coal fields of the Central, Southern and Western areas are continuing production under agreements which will make any wage increases retroactive to April 1.

Order P-56 Revised

Mid-March saw the issuance of WPB's Revised Order P-56 which came out with the announcement that "the purpose of the amended regulation is to dove-tail the over-all equipment and materials requirements of the mining industry with the master pattern of industry operations under the Controlled Materials Plan. Allocations of materials and equipment will be authorized from time to time for the mining industry, as a whole, in the light of mine operating schedules and total mine production goals."

The order applies to all open-pit and underground mines; mills and preparation plants; processing of refractories; and prospecting enterprises, including construction of access roads. Procedure is set up for serialized mines, foreign producers and non-serialized mines and prospects. The mining industry is not subjected to CMP Regulation No. 5, which deals with maintenance, repair and operating supplies and is also free from the inventory restrictions of CMP Regulation No. 2.

It is considered particularly fortunate that the mining industry is thus enabled to remain under the Mining Equipment Division in securing its new equipment, repair parts and materials and operating supplies. A similar revision of the smelting and refining Order P-73 has been issued covering 13 non-ferrous metals—antimony, cobalt, copper, iridium, lead, mercury, molybdenum, nickel, platinum, tin, tungsten, vanadium, and zinc.

*Small Mine Hearings**

After conducting three days of hearings on March 30, 31 and April 1, Senator James G. Scrugham's mining subcommittee of the Senate Special Committee on Small Business is conducting a further round of field hearings in the West.

Calling the hearings to consider broad questions of metal and mineral policy and the role to be played by small mine operators in the war program, Senator Scrugham outlined a tentative program which involves production planning and scheduling, provision of adequate stockpiles for a long war, fullest utilization of domestic mineral sources to conserve shipping, use of marginal and small ore deposits, setting of prices to encourage maximum output, and provision of needed manpower for mine operation.

WPB Chairman Donald Nelson and Director of WPB's Mineral Resources Coordinating Division Howard I. Young appeared before the committee and explained in detail the mineral production operations of the board with particular reference to small mines and the development of new production. Figures were given by Mr. Young showing assistance rendered to small operators for mineral production in 1942 and the first two months of 1943, by the Reconstruction Finance Corporation. He enumerated commitments to 448 different projects, in a total amount of approximately $4,000,000. Two hundred and fifty-eight of these loans averaged $3,943 each and applied to 10 different strategic metals and minerals in 18 states; the remaining 190 loans, averaging $15,360 each, were made to mining men in 24 different states and Alaska to produce 18 different strategic minerals.

In response to questions on postwar mineral policy, Donald Nelson stated: "I am heartily in accord with the general principle of having the government maintain stockpiles of strategic and critical materials for war purposes." Other witnesses appearing before the committee were: David L. Podell of the Anti-Trust Division, Department of Justice; Frank A. Ayer, head of the Primary Production Section and Harry O. King, director of the Copper Division, WPB; Richard J. Lund, director of the Miscellaneous Minerals Division; Andrew Leith, Miles K. Smith, and Frank E. Hatch, of the Ferro-Alloys Branch, Steel Division; and Interior Secretary Ickes. Ickes spoke of the research work of the Bureau of Mines on low grade and complex ores and voiced approval of Senator Scrugham's position on stockpiling.

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* A 10-page synopsis of the hearings has been prepared by the American Mining Congress and is available for readers of MINING CONGRESS JOURNAL.

Cracking Hard Rock on "The Hill"

Mining Congress Journal will furnish readers, upon request, with official Government statements on any of these brief summarized announcements

COAL

Bituminous Use Above Output. Office of Solid Fuels Coordinator for War. Consumers burned an estimated 6,520,000 more tons of bituminous coal in January than mines produced, but users' and dealers' stockpiles prevented critical shortage from hampering war activity or causing widespread distress among domestic soft coal consumers.

Higher Briquettes Prices Allowed. Office of Price Administration. Producers of briquettes and packaged coal made from bituminous coal may increase maximum prices to cover added costs resulting from recently authorized adjustments in maximum prices at mines. OPA ruled in amendment 11 to MPR-121, effective March 3.

Coal Service Fees Defined. Office of Price Administration. Service fees which bituminous coal distributors handling lake or tidewater shipments charged during the base price period—October, 1941—form the basis for determining the maximum amounts which may be added for such services to current ceiling prices for the coal, the OPA stated in Amendment 46 to MPR-120—effective March 6.

OPA Adjusts Coal Prices. Office of Price Administration. Bituminous coal prices in two additional districts were increased by the OPA on March 6 to reflect added costs for overtime labor for the six-day week and higher non-labor costs of operations. All increases are passed on to the consumers in accordance with Revised Maximum Price Regulation No. 122.

Coal Production Reaches New High. Office of War Information. Bituminous coal production reached an estimated 12,680,000 tons in the week ended February 27, the highest production in nearly 16 years.

Coke Allocation Basis Set. War Production Board. An order, under which coke made from bituminous coal can be allocated, if such action becomes necessary, was issued March 12 by WPB in M-292.

Indiana Soft Coal Prices Raised. Office of Price Administration. Maximum prices at all sales levels of bituminous coal mined in District No. 11—Indiana—were increased an average of 20 cents per ton by OPA in Amendment 48 to MPR 120, effective March 13.

Certain Anthracite Priced. Office of Price Administration. Anthracite in sizes smaller than buckwheat No. 3 when used in manufacture of calcium carbide, graphite or activated carbon now have a maximum price of $1.80 per ton, under Amendment 12 to 112.

Lake Coal Cost Higher. Office of Price Administration. Maximum prices on lake shipments of bituminous coal and anthracite moving to certain parts of Lakes Superior and Michigan were increased substantially by OPA by Amendment 2 to MPR-122, effective March 19.

METAL

Copper-Beryllium Scrap Routed. War Production Board. Director General for Operations ordered on March 1 that copper scrap and copper base alloy scrap containing 0.1 per cent or more beryllium be delivered only to persons specifically authorized by WPB to receive such scrap with issuance of Supplementary Order M-9-b, as amended.

Antimony Limitations Eased. War Production Board. Limitations on use of antimony in production of automotive batteries and alloys were removed and weight-limit for small deliveries of antimony to any one person was substantially increased under amended General Preference Order M-122 issued March 7 by Director General for Operations.

Cobalt Restrictions Relaxed. War Production Board. Amended Order (M-39) covering use of cobalt, which will have effect of relaxing restrictions, was issued March 9 by Director General for Operations.

Great Lakes Ore Quota Raised. War Production Board. Tentative quota of 95,000,000 gross tons, mine weight, for 1943 Great Lakes iron ore movement was announced March 9 by WPB.

Molybdenum Order Clarified. War Production Board. If recovery of molybdenum from chemical compound is commercially practicable, such compound comes within scope of Molybdenum Order M-110, it was made clear on March 11 by Interpretation 1, issued by Director General for Operations.

Copper Scrap Dealers Restricted. War Production Board. Dealers who accept copper materials as scrap may not dispose of it in any other form, except with specific permission of WPB, Director General for Operations ordered on March 11 through revision of S. O. M-9-b.

Salt Lake Tribune.

Great Lakes Traffic Aided. Office of Defense Transportation. ODT on March 11 temporarily suspended certain restrictions intended to give preferential treatment to ore cargoes by Suspension Orders ODT-25-3 and 9-1.

Zinc Slab Control Modified. Office of Price Administration. Secondary slab zinc that fails to meet specifications

for Prime Western grade must be sold below maximum price for that grade OPA ruled in MPR-3, effective March 18.

Copper Scrap Prices Set. Office of Price Administration. By establishing specifications and cents-per-pound prices for 16 new grades of copper scrap and copper alloy scrap, OPA brought under specific prices entire field of such material in MPR-20. This became effective March 22.

Certain Ore Processes Freed. Office of Price Administration. Price control affects primary copper, lead and zinc only in their refined form, OPA announced on March 19 in removing milling, smelting, and refining of ores of three metals from control under General Maximum Price Regulation by Amendment 15 to RSR-11, effective March 24.

Chrome Deliveries Encouraged. Office of Price Administration. Delivery of small quantities of domestic chrome ore for stockpile of Metals Reserve Company is encouraged by amendment to chrome ore price regulation issued March 19 in Amendment 1 to MPR-258, effective March 24.

Combined Aluminum Rule Set. Office of War Information. Combined Aluminum Committee, representing U. S., United Kingdom and Canada, has been established to coordinate activities of three countries in respect to metal.

NON-METALLIC

Quartz Crystal Control Tightened. War Production Board. Regulations governing use of quartz crystals were further tightened in March with issuance of amendment to General Conservation Order M-146 that will permit Director General for Operations to issue special directions with respect to use, fabrication and delivery.

Shale Oil Production Discussed. Department of the Interior. Bureau of Mines has issued detailed report describing proposed methods of mining oil shales in Garfield County, Colo., where Bureau already has produced shale oil in experimental reports.

EQUIPMENT

Electric Motor Scheduling Urged. War Production Board. Recommendations for scheduling electric motor production were discussed at recent meeting of Electric Motor Industry Advisory Committee with officials of WPB, it was announced March 1.

Mine Materials Order Amended. Office of Price Administration. Treating plants may add the cost of inbound freight to their maximum delivered prices for sales of eastern wooden mine materials. The ruling is contained in Amendment 3 to MPR 218, effective March 12, 1943.

Mining Machinery Control Tighter. War Production Board. Mining equipment industry was placed under strict wartime control on March 11, with issuance of Limitation Order L-269, WPB to direct scheduling by manufacturers of production and deliveries of mining machinery, maintenance materials, repair parts and equipment replacements.

Electric Motors Simplified. War Production Board. Controllers for electric motors will conform to specific simplifications practices designed to conserve critical materials, under terms of General Conservation Order L-250 issued March 13 by Director General for Operations.

Mining Equipment Facilitated. War Production Board. Simplified procedure governing purchases and deliveries of mining machinery, equipment and supplies for account producers in all branches of mining industry was announced March 17 by WPB with issuance of amended version of Preference Rating Order P-56.

Shoe Ration Order Modified. Office of Price Administration. Miners and other industrial workers after using their own No. 17 ration stamp **need not use any of their family's stamps for safety shoes** but may apply for the necessary extra ration at their local board. This ruling is contained in Amendment No. 5 to General Rationing Order No. 17 issued by OPA on March 18 and effective March 24, 1943. Safety shoes are defined by the amendment as meaning protective occupational shoes incorporating one or more of the following safety features: steel toe box, electrical conductivity or resistance, and non-sparking and molders Congress type protective shoes which can be speedily removed and which are worn to protect against splashing metals. Action taken under Amendment 5 to RO-17, effective March 24.

GENERAL

Access-Road Project Announced. Federal Works Agency. Two thousand eight hundred and fifty miles of access roads to mines, quarries, and forests have been scheduled for construction, Public Roads Administration Commissioner MacDonald announced on March 19.

Labor Absenteeism Discussed. U. S. Department of Labor. Absenteeism in war production plants can be reduced by cooperation of labor and management and assistance of industrial experts of the U. S. Department of Labor and State departments of labor, Secretary of Labor Perkins has declared.

Absenteeism—Two kinds

Added "Gas" for Work Needs. Office of Price Administration. Emphasizing that new cut in basic gasoline rations on East Coast increases importance of car-sharing, the OPA on March 19 announced provisions for granting necessary replacement rations to motorists needing their cars for occupational use.

Timely Tire Recapping Urged. Office of War Information. To keep necessary automobiles on road during 1943, car owners will have to have their tires recapped at right time, OWI warns.

Menace of Inflation Surveyed. Office of War Information. Present fight against inflation marks greatest—and almost only—major effort in history of world to prevent inflation's ravages, OWI pointed out on March 21 in brief examination of man's past experiences with economic enemy.

PERSONALS

James K. Richardson, secretary of the Tri-State Zinc and Lead Ore Producers Association, resigned from his position on March 20, following his

announcement that he had been reappointed a first lieutenant in the United States Army. Mr. Richardson held the position as secretary nearly a year, and members of the association accepted his resignation with regret. He will be stationed in Camp Wallace, Texas, with the Coast Artillery. F. Netzeband, air hygiene engineer for the Association, is in charge until a successor to Mr. Richardson is selected.

Roy Robertson has been promoted from mine foreman of the No. 4 mine of the West Virginia Coal & Coke Corporation to superintendent of the company's No. 15 mine at Stirrat.

Retirement of **J. H. Davis,** manager of the New Cornelia branch of the Phelps Dodge Corporation in Ajo, was recently announced by **H. M. Lavender,** general manager. He was succeeded on March 1 by **L. M. Barker,** general superintendent of the New Cornelia branch since July, 1942. Mr. Davis retired because of ill health after 31 years service with the corporation.

Mr. Barker has been with the New Cornelia branch of the Phelps Dodge Corporation since May, 1937. He joined the staff of the Nevada Consolidated Copper Corporation, at Hayden, in 1916. After war service, 1917-19, he returned to the Hayden mill as research chemist. In 1923 he entered the employ of the Utah Copper Company at its Magma plant, where he became metallurgist. He returned to Arizona in 1927 to work for the United Verde Copper Company at Clarkdale as mill superintendent, which position he held until he changed to the New Cornelia unit.

The Tennessee Coal, Iron and Railroad Company, subsidiary of the United States Steel Corporation made an announcement of personnel changes earlier in the year.

Thomas Chalmers, vice president in charge of manufacturing operations, has assumed the duties of vice president in charge of raw materials. **A. B. Haswell** has been appointed assistant vice president in engineering and construction. **R. E. Kirk,** formerly general superintendent of coal mines is now assistant vice president in charge of raw materials and **J. M. Spearman,** formerly general superintendent of Fairfield Steel Works is now assistant vice president in charge of manufacturing operations. **N. L. Van Tol,** formerly Fairfield works manager, has been assigned exclusively to the duty of post-war research, looking to the planning for peace-time developments and economics of the company under the direction of **Robert Gregg,** president of the company. **James C. Gray,** formerly chief inspector and superintendent of industrial relations for the company's coal mines, is now general superintendent of coal mines. **A. J. Blair,** head of the geological department, reports to **A. B. Haswell,** assistant to vice president in engineering and construction. **J. J. Phifer,** formerly assistant general superintendent of the Fairfield Steel Works, is now general superintendent of the works. **Dudley Vaughn** succeeds Mr. Phifer as assistant general superintendent of the steel works.

John T. Burrows has been elected vice president of the Minerals Separation North American Corporation with headquarters at 11 Broadway, New York City.

H. H. Otto, mining engineer, Hudson Coal Company, has been appointed to the Post-War Planning Committee of the Pensylvania Society of Registered Professional Engineers.

Appointment of **Dr. P. W. Leppla** to the position of chief chemist of its Research Division is announced by Cardox Corporation. Dr. Leppla will make his headquarters in the general offices of the company in Chicago, reporting to Dr. Charles A. Getz, director of the Research Division.

Alex U. Miller has been appointed as special assistant to the Deputy Solid Fuels Coordinator for War according to a recent announcement by Solid Fuels Coordinator for War Harold L. Ickes.

Alexander C. Brown, Deputy Director of WPB's Steel Division, has resigned to return to his former duties as first vice president of the Cleveland-Cliffs Iron Company.

Ernest G. Schell has been appointed general superintendent of the Lorain Coal & Dock Company according to recent announcement by L. G. Lorms, general manager, Columbus, Ohio.

John F. Berry was recently appointed as manager of the Moctezuma Copper Company at Nacozari, Mexico, filling a vacancy created by the recent death of **A. B. Williams.** This company is a subsidiary of the Phelps Dodge Corporation.

George Heikes, Director of WPB's Zinc Division, has stated that he will leave WPB in the near future, after

a successor has been appointed. It is understood that Heikes will take a position with western mining interests.

Walter C. Page, deputy director, Zinc Division, is also resigning his position in the next few weeks, to become affiliated with the U. S. Smelting, Refining and Mining Company.

Dennis L. McElroy, chief of the Coal Mining Section of the Mining Equip-

ment Division, is leaving May 1 to become chief engineer for Consolidation Coal Co., Fairmont, W. Va.

Francis A. Thomson has severed all professional connection with the Parker-Burrows-Theis mining interests in Montana and elsewhere.

J. J. Quinn was appointed Assistant Traffic Manager of the Rochester & Pittsburgh Coal Company with headquarters at Indiana, Pa., effective January 16.

J. B. Knaebel, geologist for U. S. Smelting, Refining & Mining Co., Vanadium, N. Mex., has been transferred to the Gold Hill, Utah, property of the same company, to reopen and equip a mine.

C. S. Gunther, general manager of the Harlan Fuel Company, has been reelected president of the Harlan County Coal Operators Association. **H. E. Lawson**, general manager of the Cornett-Lewis Coal Company, was reelected vice president and **George S. Ward** was reelected secretary.

Harrison A. Schmitt, consulting geoligist, of Silver City, N. Mex., has joined the staff of the U. S. G. S. as a senior geologist serving as consultant. He will continue as a consulting geologist for several mining companies of New Mexico and Arizona.

Election of **Louis G. Bissell** as chairman of the board has been announced by Mack Trucks, Inc. Mr. Bissell, a member of the law firm of Chadbourne, Wallace, Park and Whiteside, has served the company for many years as a director and counsel.

Also announced was the election of **Charles T. Ruhf** as president of Mack Manufacturing Corporation and executive vice president of the parent company, Mack Trucks, Inc. Mr. Ruhf was formerly operating vice president in charge of factories and has been with the company since 1912.

Announcement is made of the appointment of **Wesley C. L. Hemeon**, of Brookline, Mass., as industrial hygiene engineer on the staff of Industrial Hygiene Foundation at Mellon Institute, Pittsburgh, and ex-officio is an industrial fellow of that institution. Mr. Hemeon, a graduate of Massachusetts Institute of Technology, where he received the Master of Science degree in 1927, has been industrial hygiene engineer for the Massachusetts Department of Labor for the past seven years. Prior to that time he was engaged in research and development for the Dewey and Almy Chemical Company.

Roy M. Smith, who joined the Roller-Smith Company, Bethlehem, Pa., in August, 1942, as assistant chief engineer, has been appointed chief engineer, succeeding J. D. Wood, resigned.

—Obituaries—

Ernest Gayford, 71, one of the original organizers of the General Engineering Co., of which he was president, died on March 3 in Salt Lake City, Utah. Mr. Gayford was also president of the company's two affiliates, General Engineering Co. of Canada, Ltd., of Toronto, Canada, and the British General Engineering Co. of London, England.

C. T. Keigley, 51, general superintendent of operations for the Columbia Steel Company, died suddenly on March 11 at his home in Salt Lake City, following a stroke of apoplexy.

During the 10 years that he had resided in this state he had won a host of friends through his activities in civic work and as a sportsman. He

was known to thousands of workers as well as his fellow executives as just plain "Keig." Mr. Keigley was born November 2, 1892, in Madrid, Iowa. He attended Iowa State College at Ames, Iowa, where he majored in electrical engineering. He took a postgraduate course at the University of Illinois at Urbana, Ill., and in 1915 went to Gary, Ind., where he started work for the Carnegie-Illinois Steel Company. In 1923 he came to Provo for the Columbia Steel Company and had served in many responsible positions at the Ironton plant since that time. He had served as general superintendent for the past 10 years.

Besides his widow, surviving are one son, Ensign Richard B. Keigley, serving with the U. S. Navy on overseas duty; one daughter, Claire E. Keigley of Provo.

J. W. Gardner, 80, formerly Chairman of the Executive Committee, Gardner-Denver Co., Quincy, Ill. died on February 1. Born August 19, 1863, Mr. Gardner was associated with the Gardner-Denver Company from 1881 until ill health forced him to withdraw from active participation in business several years ago.

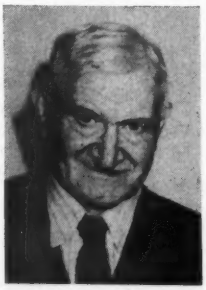
Under Mr. Gardner's able direction, extending over a period of more than 60 years, the Gardner-Denver Company grew from a small concern employing 40 men to the present company with its payroll of more than 2,000 employes. His unusual ability to select, train and inspire his associates was one of his greatest contributions to the growth and progress of the business.

Louis C. Madeira, III, 51, Executive Director of the Anthracite Institute, died suddenly on March 20. Mr. Madeira had recently tendered his

resignation, effective March 15, to that organization, following his doctor's instructions because of his ill health. Mr. Madeira was Executive Director of the Anthracite Institute for the last nine years.

His experience in the coal mining industry covered a period of 30 years, during which he served in every capacity from a digger of coal, through mine foreman, superintendent, manager, to vice president. Mr. Madeira's death is keenly felt by the many with whom he had come in contact in the fields of operation in the anthracite mining industry.

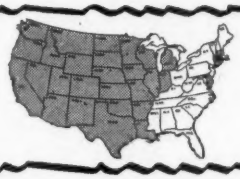
Harry S. Joseph, 76, well known in western mining circles, died recently at his apartment in the Hotel Utah, Salt Lake City, following a lingering illness. Mr. Joseph had been identified with the Carisa Mining Company as president and general manager, and the East Standard Mining Company, as manager. At the time of his death he was president and general manager of the Silver Shield Mining and Milling Co. He had de-



voted virtually all his life in the interests of the mining industry and was also active in Utah political, civic and fraternal affairs. Mr. Joseph was a member of the American Mining Congress and for several years served as president of the Great American Prospectors Association.

News and Views

Eastern States



PENNSYLVANIA

»»» The Cranberry Improvement Company will soon start an extensive stripping program at its Cranberry Colliery. The project involves a relocated new colliery shop, and a new slope which will make it possible to abandon the existing main slope from which coal has been hoisted into the breaker for many years.

»»» Plans are being considered by the Philadelphia & Reading Coal & Iron Company for the construction of a cleaning plant near their abandoned North Mahanoy Colliery. It will clean their refuse banks in the Mahanoy Valley.

»»» Anthracite Industries, Inc., under the direction of Frank W. Earnest, Jr., has announced a customer's service plan designed to save manpower, money, gasoline, and tires. When Mrs. John Doe phones and complains of no heat from the coal, too much ash, coal gas, burning too much coal, etc.; the office attendant will read to her the answers from a book provided by Industries, Inc. The attention of the manager, and a possible trip of a service man to the home is thereby avoided.

»»» Anthracite coal mining men are interested in the 1943 triennial hearings on coal land, valuations now being held before the County Commissioners of Schuylkill County sitting as a Board of Revision. About ten prominent mining companies in the Schuylkill area will appeal their respective cases from which much information will come concerning the value of coal lands.

»»» When the strike about increased union dues developed during January, it was thought by many that the proper time and place to consider the question would be the Tri-District Convention of the United Mine Workers held in Scranton during March. It is pertinent to know that resolutions were proposed at the convention to consider the question, but they received relatively no attention—the all-important topic being that $2 per day increase in wages.

»»» Concern is being shown by many mining companies about the rationing of safety shoes, the use of which has become extensive and of much value in reducing foot accidents. (See page 50, *Shoe Ration Order Modified.*)

»»» Counsel for the Susquehanna Collieries Company of Nanticoke petitioned the Federal Court in Scranton for an order to compel Gerald Donahue and 150 other employes who have sued the company for overtime pay amounting to $50,000, to submit the complaint to a board of arbitrators. C. A. Gibbons is vice president and general manager of the company.

»»» Good operating results have been obtained by the Necho Coal Company from a 66 KWH storage battery set when used to operate compressors and cutting machines at the mining face. Obviously such practice tends to make gassy mines more safe.

»»» The Lehigh Navigation Coal Company, Inc., is holding a series of meetings for its organization on "The Preventive Maintenance of Electrical Equipment." Addresses will be delivered on the subject by men prominent in the manufacture of electrical equipment used in coal mines. W. E. Conner, assistant mechanical engineer of the company is sponsoring the timely activity.

»»» Post-war conditions of the anthracite industry are receiving much attention by Anthracite Industries, Inc., through its much enlarged research program. The numerous unbelievable wartime products with a peacetime value developed by other industries should spur our researchers to perfect a low-cost heating unit sufficiently automatic that the coal consumer need not enter the cellar either for the purpose of shoveling coal or removing ashes. Ash removal is the problem to be solved before post-war competition develops.

»»» Shareholders of the Glen Alden Coal Company, the nation's largest producer of anthracite coal, were informed at the annual meeting that the company's net income for 1942 was $2.81 per share of outstanding stocks, an increase of 64 cents a share over the previous year, and the highest since 1931 when it was $3.75 per share. These officers were renamed: C. F. Huber, chairman of the board; Major W. W. Inglis, president; and Edward Griffith, vice president and general manager.

»»» Hobart L. Littell of the Anthracite Institute gives this advice regarding fuel oil conversions being made at the direction of the Petroleum Administration: "In connection with widespread conversions from fuel oil to solid fuel, it is imperative that fuel consumers consult with their prospective source of solid fuel supply as to the size and type of solid fuel which would represent a sensible selection under wartime conditions. Far too many conversions have been made with equipment which can use only a narrow-range of sizes and types of solid fuel."

»»» A corporation charter has been granted to the M. and S. Coal Company with these well known mining

men as the incorporators: A. J. Schrader and Robert Y. Moffat, Scranton; and W. K. Moffat, Elmhurst. The corporation was capitalized at $100,000, its purpose being to "own, lease, mine, strip and market coal."

» » » An accelerated wartime demand for low ash steam sizes has resulted in several important installations of Wilmot hydrotators. Three hydrotators for cleaning rice, barley and anthrafine have been placed in the Loree breaker of the Hudson Coal Company. Their combined output is 170 net tons of cleaned coal per hour, and the Jeddo Highland Coal Company has installed, in its No. 7 breaker, a 7-ft. No. 4 buckwheat hydrotator with a capacity of 45 net tons per hour.

WEST VIRGINIA

» » » Without fanfare Mr. Lewis and his advisory committee stepped right into the stream of the 1943 wage negotiations which were already muddied by the advent of the six-day week. If they made any soundings, the sounding lead made little or no splash, but their original demands indicate some fairly deep water to be encountered.

» » » Another disturbing element is injected into the economic affairs of the West Virginia coal industry by a bill that has been entered in the West Virginia Legislature now in session. For years, now, each regular session of the Legislature finds one or more overly-ambitious members introducing a bill which would result in increasing the cost of the workmen's compensation to its contributors. The latest of these bills would increase the charge for a temporary total disability from 66⅔ percent of an average weekly earning from $16 to $18 while the minimum is lifted from $8 to $12. If no other change was included in the proposed change from the present law, the increases noted would run into startling figures as a charge to the operating accounts.

But the proposal does not stop there. The present law says: "If the deceased employe be a widow or widower and leave a child or children under 16 years of age, the payment shall be $10 per month to each child until he or she reaches the age of 16 years." The proposed change here is that the child will be paid until 18 years of age is reached and instead of $10 the amount paid to such children will be $15. This, also, considered independently, would develop, upon analysis, another staggering sum to be absorbed by production.

There are other changes proposed in the bill leading to by-paths of the present law and with upward inclination which would add important if not impressive costs to the producers compensation bill. The increase has been estimated by interested observers to approximate $2,000,000 or more to subscribers' open accounts with attendant increases for production costs.

» » » A ray of sunshine and financial relief for West Virginians generally has been provided by the same Legislature by the repeal of the West Virginia income tax law, exemption of consumers sales tax upon all food purchases up to 50 cents and a reduction of 10 percent to the gross sales tax. These are important and welcome tax savings that should not be channeled back to the heavy taxpayers through the medium of concealed charges.

» » » A new underground substation constructed of concrete blocks and fireproofed has been completed at the Marianna Mine of the Island Creek Coal Company. Installation of equipment is expected to begin in the near future.

» » » The Four States coal mine in Marion County has been completely rehabilitated and mechanized by the Frank E. Christopher coal interests following an idleness of 11 years. Operations will be under way following the signing of the new bituminous contract and the production objective is 6,000 tons of coal per day. A spur of the Baltimore and Ohio Railway connects the property with the main line railway.

» » » The West Virginia Society of Professional Engineers on March 24 urged Governor Neely and West Virginia's congressional delegation and national engineering societies to oppose certain provisions of a contract being negotiated for by the United Mine Workers. The society's board of directors had adopted a resolution on the previous day, in formal protest against the UMW demand that the new bituminous coal contract include provisions for unionization of all mine personnel except superintendents.

The resolution stated: "This apparently contemplates the inclusion of engineers and surveyors 'inside or outside of the mine' as 'mine workers,' thereby forcing many members of the engineering profession, as a condition of continued employment, to join the United Mine Workers of America."

The board asserted that engineers

YES . . .
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And at a cost of about ½ cent per ton mined

COMPOUND-M, as received at the mines, in concentrated form is not expensive. As used, it is diluted from 600 to 1000 times. The equipment necessary to outfit the mine is not expensive either and most mines have the materials in their stores. If they must buy some equipment, it gets a very high priority.

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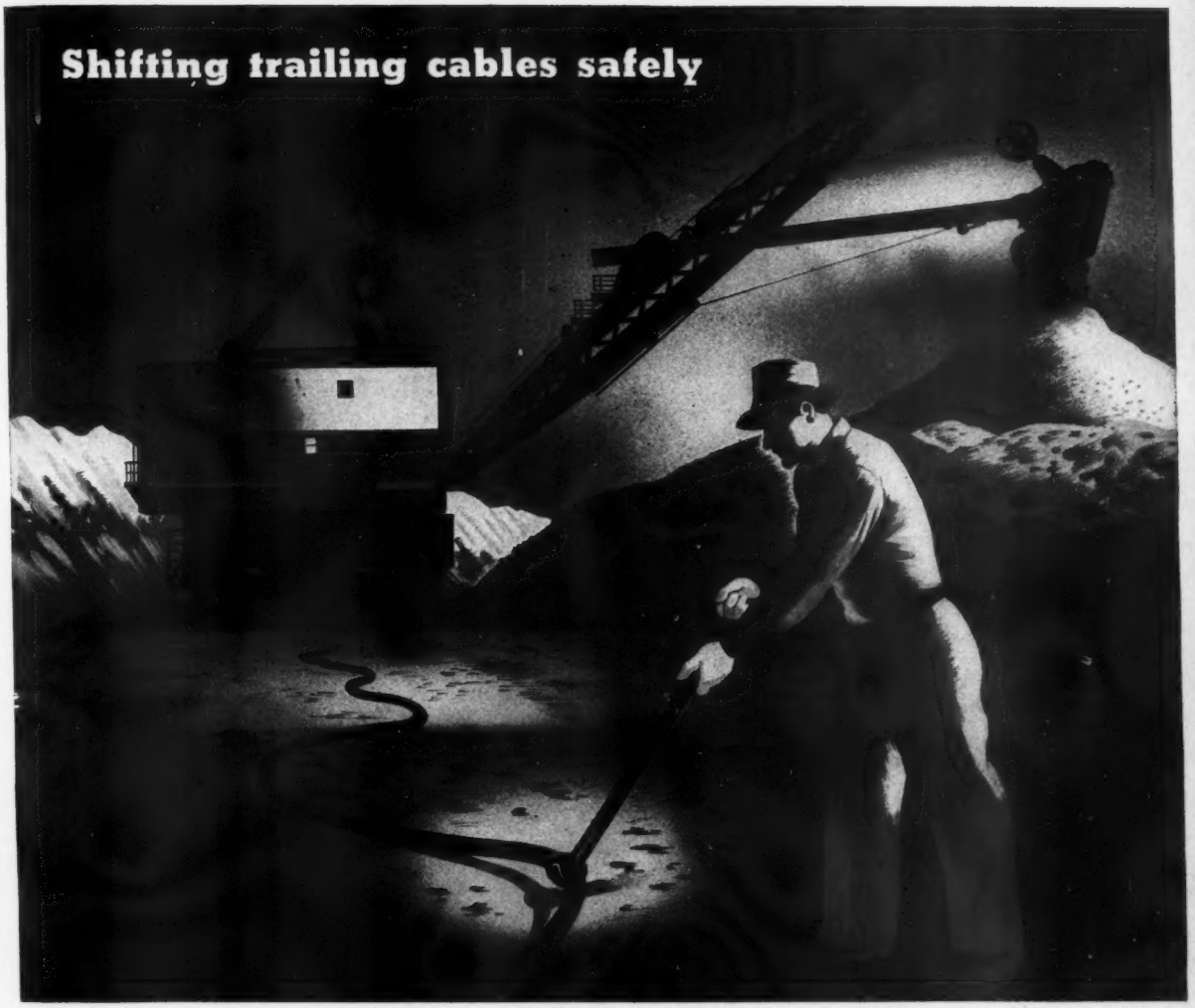

Information supplied by an Industrial Publication

Shifting of the insulated power cables of electric shovels in strip pits or open-cut operations can be done handily and safely by the use of a simple cable safety hook developed at an anthracite stripping. The hook, easily made in most any shop, merely consists of two metal hooks riveted in reverse positions on the end of an ordinary short wooden shovel handle.

To use, the cable hook is placed on the cable and given a quarter-turn which places the two individual hooks around the cable. The double hook allows for a secure grip without damaging the insulation, and the wooden handle provides protection from possible current leaks through the insulation. The shovel grip gives a man a good hand hold. Two men can work together on heavy cables.

Electric cables should always be handled carefully—and safely.

A good cable safety hook protects both the cable and the worker—and makes the moving job easier.

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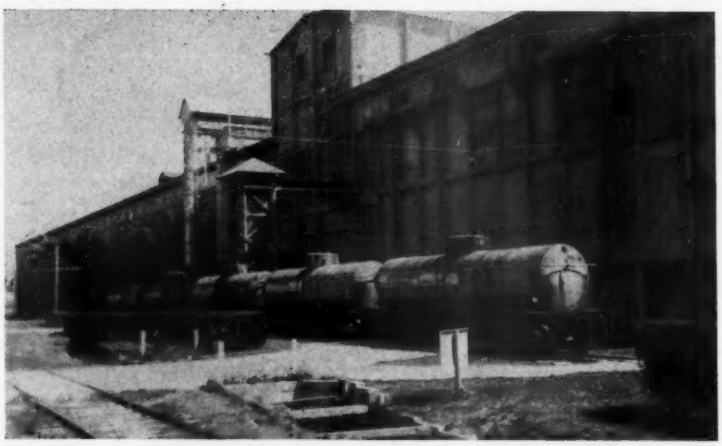
MOLY

were members of a "learned profession and that their functions in any industry are technical, regulated by professional standards, and advisory to the management, and in the exercise of such functions cannot properly be regulated or represented by labor unions."

» » » The Edna mine of the Virginia and Pittsburgh Coal and Coke Co., at Brady, was recently sold to the Jamison Interests of Greensburg, Pa. The mine, located in Monongalia County along the Monongahela River near the Marion County line, has been rehabilitated and operations are expected to begin in April. About 300 men will be employed. Production was suspended at this property in August, 1937.



Chemical tank cars waiting along side of phosphate storage plant in Florida

NEW ENGLAND STATES HAVE WAR MINERALS

FACILITATING THE development of war minerals in the New England States, the Bureau of Mines has issued a comprehensive report describing the occurrence of rare alkalis of that area, particularly lithium, which is being used in alloying and welding metals and in certain war equipment, Dr. R. R. Sayers, Director of the Bureau of Mines, announced on March 19.

Spodumene, varieties of which provide attractive gem stones, is one of the most plentiful lithium minerals in New England and is found in Maine, Massachusetts, Connecticut and New Hampshire, the report shows. Cesium, of which Maine is the largest producer, and rubidium, of which Maine has the largest known reserves, are rare alkalis employed in the manufacture of photoelectric cells.

While the rare alkalis of the area have been discussed in many technical papers prepared by mineralogists, the Bureau's publication is the first to list in detail the estimated quantities of these materials in the New England States. Lithium, listed as "essential" by war agencies in the United States and Great Britain, is employed in the alloying and welding of aluminum, magnesium and other war metals and is utilized in the manufacture of chemicals, lubricants, photographic papers, optical glass, electrical equipment and rayon.

The report was written by Frank L. Hess, principal mineralogist of the Bureau of Mines; Roscoe J. Whitney, Boston, Mass., chairman of the Committee on Miscellaneous Nonmetallics, New England Council; Joseph Trefethen, professor of geology, University of Maine, and Morris Slavin, associate spectroscopist, Bureau of Mines.

NEW HAMPSHIRE

» » » Deposits of mica in this state are being developed and some production is being obtained. A brief account of two deposits is given from recent reports by the Department of the Interior. The Blister mica quarry, in the town of Alstead, Cheshire County, N. H., has recently been studied and mapped by D. M. Larrabee and G. H. Brodie of the Geological Survey, as a part of a general investigation of domestic mica deposits. The operation is relatively new, work having been started in August, 1942, by the New Hampshire Mica & Mining Co., Keene, N. H. Development consists of a broad, shallow open cut into the east face of a low hill.

Pegmatite is exposed in a dome-shaped knob extending 250 ft. from north to south and 150 ft. from east to west, and it may continue under shallow overburden northward and southward along the low ridge. The wall rock is biotite schist, in which the foliation, as exposed along the east or hanging wall, strikes north and dips steeply to the east.

The sheet mica lies in a blanket 3 to 5 ft. thick along the east contact. It gradually becomes less abundant and of poorer quality toward the center of the pegmatite body. The mica is hard, ruby-colored to rum-colored, and usually free from stains, although some is ruled or reeved or shows "A" structure. It is associated with oligoclase and quartz. In places near the contact the mica books make up as much as 75 percent of the whole, and, although this is much higher than normal, the average concentration of muscovite is unusually high.

» » » The Big mine, also in the town of Alstead, has been studied and mapped by the Geological Survey. The mine, a combination of properties formerly known as the Davis and Rhoda mines, was originally opened for mica in 1810. Since that time it has become one of the largest producers of sheet mica and feldspar in New Hampshire. Some years ago it was purchased by the Golding-Keene Co., Keene, N. H., and operated chiefly for feldspar. Flooded in recent years, it was dewatered by the owners in the fall of 1942 and is again being operated for sheet mica and feldspar, with quartz and beryl as by-products. Development consists of a series of stopes, shafts, and drifts along the west wall north of the open pit, which occupies the center of the pegmatite and extends along the east wall to the south. The part of the west wall contact zone that lies south of the open pit is being operated by the New Hampshire Mica & Mining Co., whereas the pegmatite north of the pit is being operated by the Golding-Keene Co. Development between levels has been carried on by benching and room and pillar methods.

PETER F. LOFTUS
Consulting Engineers
ENGINEERING AND ECONOMIC SURVEYS, ANALYSES AND REPORTS ON POWER APPLICATIONS AND POWER COST PROBLEMS OF THE COAL MINING INDUSTRY
Oliver Building Pittsburgh, Pa.

L. E. YOUNG
Consulting Engineer
Mine Mechanization
Mine Management
Oliver Building Pittsburgh, Pa.

NEW YORK

»»» To expand its facilities for serving industrial consumers, the Coal Bureau of the Upper Monongahela Valley Association, Fairmont, W. Va., has opened offices in the Chanin Building, 122 East 42nd Street, New York City. Julien E. Tobey is managing director. The Bureau serves as a clearing house for information on Fairmont-Pittsburgh seam coal, supplies fuel engineering data, and assists in the economical utilization of fuels.

NEW JERSEY

»»» Lack of cooperation to maintain "exacting standards of production, mainly because of work stoppages," Admiral C. C. Bloch, chairman of the Navy Board of Production Awards, on March 16 withdrew the Army-Navy "E" award from the Bayway plant of the Phelps Dodge Copper Products Corporation at Elizabeth, N. J. The Board's decision was made known in a letter addressed to Wylie Brown, president, by Admiral Bloch.

The "E" was awarded for six months only and was subject to renewal.

Mr. Brown said he believed the employes regretted the incidents that made necessary the withdrawal and expressed the hope that "at some early date the award will be returned to the gratification of the workers and the executives of the company."

Admiral Bloch stated, however, that a renewal of the "E" award was won by the Yonkers, N. Y., plant of the Habirshaw Wire & Cable Division of Phelps Dodge. A new pennant with a white star affixed is being shipped to the company, he said.

TENNESSEE

»»» Robert Gregg, President, Tennessee Coal, Iron and Railroad Co., Subsidiary of United States Steel Corporation, made the following announcement earlier in the year about the company's operations in Tennessee and New York: "Of vital importance to the war effort of this nation is zinc. Our company for a number of years has directed the production of zinc concentrates by the Universal Exploration Co., a sister United States Steel Corp., subsidiary, at Jefferson City, Tenn. This work has been under the direct supervision of C. E. Abbott, vice president in charge of raw materials of both Tennessee Coal, Iron and Railroad Co., and of the Universal Exploration Co. Due to expansion of the Universal Exploration Co. for development of additional tonnage of zinc concentrates at both Jefferson City, Tennessee and Gouverneur, (St. Lawrence County) New York, Mr. Abbott will devote his entire time to that company's affairs."

KENTUCKY

»»» The Sizemore Mining Corporation has started coal production from its property near Drift, Ky., under the direction of J. C. Cooley. The mine is a hand loading operation employing Jeffrey cutters and Manhattan rubber belt conveyors.

ALABAMA

»»» The mining industry of Alabama, during the first two months of 1943 has been operating virtually at capacity. Reports show that coal production totaled 3,195,000 tons, against 3,043,000 tons in the preceding two months.

»»» The Division of Safety Inspection, Department of Industrial Relations, State of Alabama, will hold a semi-annual examination for mine foremen and fire bosses on April 19 at Fort John C. Persons, in Birmingham. An unusually large number of men have been attending night school in preparation for this examination.

»»» The Alabama By-Products Corporation, with headquarters in Birmingham, operate six coal mines in the district. They are operating at capacity, on a two-shift basis. About 25 percent of their output goes to the company's by-product plant at Tarrant City, while the remainder is sold to users of steam coal. One of the company's mines, the Barney, located on the Warrior River, ships its coal down the river on barges.

»»» The Franklin Coal Mining Co. operate a large mine at Powhattan in Jefferson County. They are running at capacity, employing a single shift. Although their mine is located on the Warrior River at present, they are shipping their output by rail.

FLORIDA

»»» Minerals Separation North American Corporation announces that it has acquired the business and assets of Phosphate Recovery Corporation. The activities heretofore engaged in by Phosphate Recovery Corporation will be continued from Mineral Separation North American Corporation from the offices at 11 Broadway, New York City, and from the laboratories at Lakeland, Fla., and Hibbing, Minn.

There's going to be one—a brisk free-for-all struggle for orders—with no holds barred.

There's no doubt about the winner—Prepared Coal! Coal thoroughly cleaned, accurately sized—coal that the smart buyers want, and will pay a higher price to get.

Make sure right now that your coal will hold its own in that tussle—will get that top price.

You can guarantee your future. You can arrange now for an adequate preparation plant custom-fitted to your particular needs. A survey and plan, drawn up by trained specialists, costs you nothing—not a penny nor an obligation. Ask us about it—and now's the time.

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Fast, rugged M-3 medium tanks are giving a good account of themselves on many battle-fronts. Likewise, M-8 and M-16 Simplex Adjustable Mine Roof Jacks are giving a good account of themselves in many mines.

It takes a lot of coal to make steel for tanks, to make munitions, drive ships, heat barracks and do the many other industrial and dormitory heating jobs. Getting it out safely, with the manpower shortage and other wartime handicaps, calls for the use of time-saving, accident-preventing Simplex Mine Roof Jacks.

Quickly set in place, they eliminate sawing, dressing and blocking of timber and provide more working room at the face. Used as temporary supports under cross timbers or beams and for holding conveyors in place. Painted *aluminum* for higher visibility — another safety feature.

M-8 is 8-ton and M-16 is 16-ton capacity. Four types of heads: swivel (as shown), "V" for round timbers, "C" for square or round and "FF" for beams or rails.

Send for Bulletin "Mines-42".

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NOW *MORE THAN EVER BEFORE . . . . . .*

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Type KSC Sectionalizing Circuit Breakers help production by providing much better continuity in the operation of mining, loading and haulage equipment. Fire hazards are reduced; maintenance is lessened; total energy consumption and power demand are lowered.

Type KSC Sectionalizing Circuit Breaker

Representatives in Principal Mining Areas

I-T-E CIRCUIT BREAKER CO.
PHILADELPHIA, PA.

NORTH CAROLINA

»»» Mica producers in the state were pleased to learn that maximum prices of domestic wet and dry ground mica and mica schist, water-washed mica and micronized mica were increased one-quarter cent a pound by the OPA on March 22. Scrap mica and crude mica schist which are used to produce ground mica are removed from price control as is domestic non-strategic punch and sheet mica.

The action is taken to permit a higher level of domestic production of scrap and sheet mica. In view of the minor significance of the action to industries manufacturing mica-contained products it should not affect ultimate consumers. The changes follow study of the domestic mining and milling situation and conferences with members of the industry and other Government agencies.

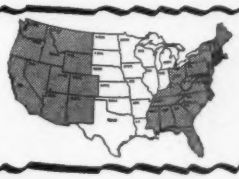
The new regulation provides that on or before May 1, 1943, every domestic producer of ground mica and ground mica schist, water-washed mica, micronized mica, fabricated mica produced from sheet mica, and built up mica, shall file with OPA a copy of his current prices for all classes of buyers, indicating in each instance his maximum price as determined by OPA regulations.

Sellers of dry ground mica and ground mica schist are permitted to add to their prices a charge for bags no greater than the cost of the bag in which the mica is contained. Sellers are not allowed to change freight allowance practices they had in effect during March, 1942, if the change would result in higher prices to their customers.

»»» H. A. Brassert, head of H. A. Brassert and Company, New York, accompanied by three top-ranking mining engineers conferred in Raleigh, N. C., on March 11 with Governor Broughton and departmental directors interested in the survey of the state's mineral resources which the Brassert firm started the following day. Governor Broughton, who is optimistic about the potential mineral possibilities of the state explained to the engineers that the survey should be based on practical approaches to the mining and mineral deposits. "We know the deposits are here, and we want to know whether they are sufficient and so located to be produced in a practical manner," stated the governor.

Engineers well known in the mining industry have undertaken the work with the H. A. Brassert and Company. They are Lucien Eaton, internationally known in the iron ore field; C. C. Morfit, authority on coal mining and coal preparation; and Earl K. Nixon, whom Mr. Brassert calls "one of our outstanding iron ore geologists and mining engineers."

Central States



ILLINOIS

»»» An electric shovel which strips nearly a million tons of earth a month from coal fields operated by the Midland Electric Coal Corporation, near Middlegrove, Ill., is speeding coal output for the war effort. The shovel's 60-ton dipper, as large as any in the world, can scoop up a freight-car load of dirt in 50 seconds. This speed is augmented by the first amplidyne control equipment ever permamently installed on any type of shovel. This equipment, together with the power generators and the motors, with a combined rating totalling 4,250 h.p., was manufactured by General Electric. The large Marion shovel operates on a three-shift basis. By means of the amplidyne control, one man, operating three master switches, controls all three motions of the shovel such as swinging into position, crowding, or moving the dipper into the earth, and hoisting the load toward the dumping spot. The control is said to use only one-hundredth the current of the conventional control. Resembling an electric motor or generator, the amplidyne generator is, in a sense, similar to radio amplifier tubes. Just as certain vacuum tubes, through the control of minute amounts of electric power, can control the flow of large amounts of power in other electric equipment, so the amplidyne generator can amplify, hundreds or even thousands of times, the variations in the power impressed upon it.

ILLINOIS MINING INSTITUTE HOLDS CHICAGO MEETING

The Illinois Mining Institute held the second of a series of conferences of purchasing agents and supply men with officials of the Mining Equipment Division of WPB in Chicago on March 31. Fifty representatives of leading coal mining companies in Illinois and Indiana attended.

A. S. Knoizen, Director of the Mining Equipment Division, and D. L. McElroy, Chief of the Coal Mining Section, gave a review of procedure for the second and succeeding quar-

The 60-ton dipper of a Marion-built electric shovel as large as any in the world shown with its crew in dipper. The amplidyne control equipment enables the shovel to scoop up a freight car load of dirt in 50 seconds in stripping overburden from a coal field operated by the Midland Electric Coal Company, near Middlegrove, Illinois

Coal Mine War Conference May 17-18
Cincinnati, Ohio

ters, and then held an open question and answer discussion on various problems under revised Order P-56, the new PD-400B quotas, the mining machinery scheduling order 5-269, and other Limitation Orders and regulations affecting the industry.

Mr. Knoizen emphasized the critical copper situation and strongly urged that everything possible be done to save copper.

It was pointed out that the second quarter is the transitory period under CMP and that mining companies should check closely with the Division regarding any problems of compliance with regulations, giving full details so that the records can be cleared properly.

The industry was strongly urged to consider the use of Bessemer instead of open-hearth steel sheets whenever possible.

It was explained that the shortage of coated welding rod is due to lack of manufacturing capacity to meet all requirements. Plain welding rods are comparatively easy to obtain and they can be used for most general purposes with certain variations in welding technique.

» » » In conformance with the war effort, the 34th Annual Convention of Mine Inspectors' Institute of America has been shortened to two days only, May 24-25, instead of its usual three-day meeting. As previously announced, the convention will be held at the Deshler-Wallick Hotel, Columbus, Ohio. C. A. McDowell, 427 Park St., California, Pa., is secretary.

MISSOURI

» » » The annual convention of the American Zinc Institute, which is generally held in St. Louis in April, will not take place this year. The Institute has notified its members that, after carefully canvassing the war agencies, it has been decided to dispense with the usual St. Louis meeting so that transportation and war production effort may be conserved. It is expected that meetings of active members and directors will be called, to be held in New York about the middle of April, but such meetings will deal only with the necessary legal formalities.

Freight cars loaded with iron ore begin a faster pace of movement from the Minnesota ranges as spring approaches. A view in one of the yards of the Great Northern Railroad in Wisconsin

TEXAS

» » » About 790,406 fine ounces of recoverable silver was produced in Texas during 1942. This was a decrease of 305,621 oz. from the previous year, according to the Bureau of Mines, due largely to the cessation of all operations in September by the American Metal Company of Texas at its Presidio Mine, Presidio County, the largest silver mine in the state. Mines in Hudspeth and Culberson County produce a small amount of silver from silver and copper silver ore.

SOUTH DAKOTA

» » » One of the few states to show an increase in silver production during 1942, according to the Bureau of Mines, was South Dakota. It produced 186,427 fine ounces of recoverable silver in 1942, all a by-product of gold mining. This is an increase of 15,656 oz., due largely to an increase in silver output from the Bald Mountain Mining Company mined near Trojan, Lawrence County.

» » » According to the annual report of the Homestake Gold Mining Company of Lead, S. Dak., which property was recently closed by government order, the company has made a clean-up of all the scrap accumulated during years of operations and has shipped the following to help the war effort: 8,407,340 lb. of steel scrap, 247,000 lb. of manganese steel scrap, 46,370 lb. of copper and brass scrap, and 30,950 lb. of rubber scrap.

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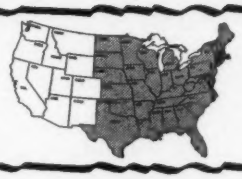


ARIZONA

»»» Established to care for wartime problems of the Arizona mines, a new Arizona Mines Division office of the War Production Board is headed by A. C. Nebeker, in Phoenix. Nebeker, formerly of the Arizona Department of Mineral Resources, will serve full time in his position, and handle duties formerly undertaken on a non-salary basis by Charles E. Martin, state coordinator of mines. The office was set up by Henry S. Wright, manager of the Arizona War Production board.

»»» Arizona state legislators, in February, adopted a memorial asking President Roosevelt and Congress to raise ceiling prices on copper, zinc, lead and other strategic metals. Ceiling prices, which may have been adequate when set, are too low in face of higher production costs, legislators asserted. The measure was introduced by the Yavapai County delegation of R. E. Perkins, Harry Metz, Leonard Klein and Al Favour.

»»» Discovery of what is said to be exceptionally high grade lead ore is reported by operators of the Copperville mine in Mohave County. Dewatering and cleaning in the mine's old workings revealed three feet of almost solid lead ore, 90 feet north of the main shaft on the 200-foot level. The mine is under lease by Mines Development, Inc., headed by M. B. Dudley.

»»» Miners opening up new ore bodies exhibit specimens of their new ores in a display maintained by Yavapai County officials in the county courthouse. The display is said to be one of the finest in the southwest.

»»» Production of silver in Arizona, according to the Bureau of Mines, was 7,050,015 fine ounces of recoverable metal in 1942, a decrease of 448,245 fine ounces (6 per cent) from 1941. About 68 per cent of the silver produced in Arizona in 1942 is recovered as a byproduct from copper ore mined at Bisbee, Jerome, Ajo, and Superior. About 64 per cent of the state output came from the Copper Queen, United Verde, New Cornelia, and Magma mines. The decrease in silver production in 1942 was a result chiefly from a decline in production from the Denn, Copper Queen, United Verde, and Magma properties, all copper producers.

»»» The Arizona Bureau of Mines announced recently the completion of a detailed geologic study of a part of the Twin Buttes mining district, 30 miles south of Tucson, undertaken as an aid to the U. S. Geologic Survey and the U. S. Bureau of Mines in the search for additional metals, principally copper, zinc, and tungsten. The survey included the Glance, Queen, King, Minnie, Contention, and Morgan mines, and various adjoining prospects, in an area credited with the production of more than $8,000,000 in metals, chiefly copper, prior to 1929.

During recent months, Reconstruction Finance Corp. loans have been granted operators of the Twin Buttes district to unwater the Glance, Queen, and Morgan properties, and to develop the Contention zinc property. The Morgan mine area is of additional interest at this time because of tungsten deposits discovered two years ago.

The geologic study was made by B. S. Butler, University of Arizona geologist, and Eldred Wilson, geologist for the state bureau of mines, and the work will be continued as more of the mine workings are unwatered, it was said by Dr. T. G. Chapman, director of the state bureau.

NEVADA

»»» A new mining company was recently organized in Reno, Nev. It is known as Strategic Minerals, Inc., and mining operations will be conducted in Esmeralda and Mineral Counties. Directors of the company are: Fred O. Gilbert, president; Charles A. Hendel, Homer L. Gilbert, William Gregory and Ernie Carver. Mrs. T. E. Carver, of Hawthorne, is secretary and treasurer.

»»» Walter B. Lenhart and J. W. Gainey, joint owners of a quicksilver deposit near Tuscarora, Nev., were recently granted a $15,000 RFC mine development loan. Mr. Gainey is superintendent and W. B. Lenhart is consulting engineer.

NEW MEXICO

»»» The increasing demand for fluorspar has resulted in greater activity by the Indian Metals Company, Lordsburg, N. Mex. Operations have been undertaken by the management at four additional fluorspar deposits in the state. E. E. Slick, Sr., is president of Indian Metals, with office in Farmers Bank Bldg., Pittsburgh, Pa. C. N. Pinkney, of Lordsburg, is vice president and general manager.

»»» High grade fluorspar is reported being shipped from a deposit about 10 miles southwest of Grants, N. Mex., where the ore is treated. Production is estimated to be around 25 tons per day. Tom Reid, of Roswell, is the owner and operator.

COLORADO

»»» The supply of the metallurgical grade of fluorspar is being supplied in steady volume from several producers in the Salida, Colo., area. Not far from the town, four mines are maintaining production, with three of the company's operating their own treating plants. They are Kramer Mines, Inc.; The American Fluorspar Co., and the Colorado Fluorspar Co.

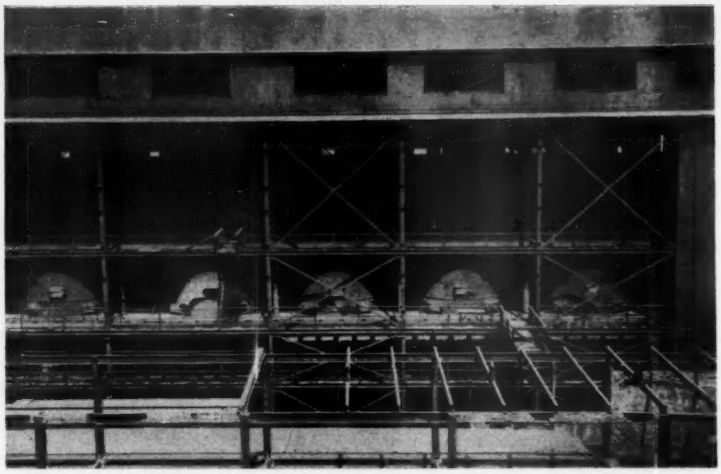
A load of scrap from the combined Metals Reduction Company, Pioche, Nevada

The Chaffee County Fluorspar Co. is conducting an exploration program and production of fluorspar is planned following completion of a stripping program.

UTAH

»»» Utah produced 10,450,035 fine ounces of recoverable silver in 1942, according to the Bureau of Mines, a decrease of 945,450 fine ounces from 1941. The output from the Bingham district increased 490,171 ounces over 1941, but it was still insufficient to off-set the losses in the Park City region and the Tintic district. In order of rank the Utah Copper Co. and the United States Smelting, Refining & Mining Co. (United States & Lark property), both in the Bingham district, the Tintic Standard Mining Co., in the Tintic district, and the Silver King Coalition, in the Park City region, were the four largest silver producers in the state in 1942. Other large producers of silver in 1942 were the Park City Consolidated Mines Co. (closed in October, 1942), New Park Mining Co., and Park Utah Consolidated Mines Co., in the Park City region, and the Calumet mine, in Tooele County. These eight properties produced about 82 per cent of the state total.

»»» Reopening of the lower levels of the old No. 1 mine of the Chief Consolidated Mining Company at Eureka, Utah, which have been under water for a number of years, is progressing favorably and production of lead-zinc ores is being stepped up rapidly to 5,000 tons per month. The water level has been lowered to the 2,000-ft. level and is being pumped at the rate of 3,300 to 3,700 gallons per minute. The unwatering program has been completed after considerable difficulty, including delay in obtaining adequate pumping equipment. The 1,800-ft. level is the main operating adit from which four winzes are being operated. Hoists have been located on the 1,800 at the collar of the Van Wagnor, 18,411, 1940, 18-88 and 1,800 winzes. The Chief Consolidated Company has been granted favorable quotas on the lead and zinc and these together with silver content of the ore, promises profitable operations. Cecil A. Fitch, Eureka, Utah, is president and general manager.



Roaster building showing bank of five 19' 6" McDougal type roaster at the Garfield Plant of the American Smelting and Refining Company

PARMANCO Horizontal Drills

PARMANCO Horizontal Drills are used exclusively in the Iron Range for horizontal drilling.

They are also used by a large percentage of the strip coal mines.

The new PARMANCO Vertical Drill has revolutionized test drilling.

Write us your drilling problems.

PARIS Manufacturing Co.

PARIS, ILLINOIS

»»» Recent developments have so improved physical conditions at the property of the Silver King Coalition Mines Company, situated in the Park City mining region, that 1943 should prove a productive year, assuming an adequate labor supply, according to James Ivers, vice president and general manager, in his annual report to stockholders. Tonnage produced during 1942, Mr. Ivers states, was below normal due to the development of a labor shortage brought about by the influx of war industries to this region. Some loss of manpower due to the draft was experienced. At one period employment was down 55 per cent of maximum employment. At the beginning of 1943 the labor situation had improved, but was still far from adequate, Mr. Ivers stated.

Mining operations produced in 1942 a total of 220 tons of first class shipping ore and 90,604 tons of milling ore. From the latter there was produced 9,324 tons of lead concentrates and 8,751 tons of zinc concentrates of a total of 18,295 tons sold to the smelter. For this product the company received $1,761,719.50 and income from other sources amounted to $11,101.84, making a total gross income for the year of $1,772,821.34. Expenses for mining, milling, administration and all other costs amounted to $1,478,095.94, leaving an operating profit of $294,725.40; deducting $49,020.16 for depreciation leaves a net profit of $245,705.24.

»»» The National Tunnel & Mines Company is now producing around 600 tons per day from its properties in the Bingham, Utah, mining district, according to recent announcement. The February production was 15 per cent greater than that of January. Mining is now being carried on from the 1,150, 1,225, 1,300, 2,700, 2,900, 3,100 and 3,300 levels and underground rehabilitation has been entirely completed. Continued production increase is expected. However, the mine is still short approximately 100 men, having a crew of about 315 at the present time. National Tunnel is controlled by International Smelting & Refining Company, and J. O. Elton, 818 Kearns Building, Salt Lake City, Utah, is general manager.

»»» The Kentucky-Utah Mining Company has approximately 100 tons of lead-zinc-silver ore on the dump of its property in the Big Cottonwood mining district, Utah, awaiting opening of the roads for shipment, according to company officials. During the winter the company opened a face of high grade lead-zinc-silver ore, but lack of storage facilities has retarded development of the showing so as to determine its importance. As soon as the winter snows are melted, it is planned to ship the ore already mined and erect ore bins in order to permit orderly extraction and exploration of the deposit. The ore was encountered in a new deep tunnel driven from the Big Cottonwood side of the mountain to explore for the downward extension of ores found in Woodlawn unit of the Kentucky-Utah property years ago. M. C. Morris, Stock Exchange Building, Salt Lake City, Utah, is secretary.

IDAHO

»»» Bunker Hill & Sullivan M. & C. Company has declared its first quarterly dividend for 1943, amounting to $327,000, or at the rate of 25 cents a share. The present disbursement brings the grand total dividend record to $57,606,241. Last year the company paid four 25-cent dividends, totaling $1,308,000. The company operates with approximately 1,585 employes, requiring a yearly pay roll in excess of $3,500,000. In addition to its output of lead, zinc and silver the company produces substantial quantities of gold, copper, cadmium, antimony and bismuth.

»»» The Coeur d'Alene Hardware & Foundry Company of Wallace has completed the fabrication of a second set of heavy duty rolls for the

The Great Accelerator

IN strategic metal mines where increased production is a *must*—where manpower is a problem—where efficient methods are most needed—the Gardner-Denver GD-9 Mine Car Loader could be called the "Great Accelerator."

Mining operators report greater ore tonnage, lower cost—wherever Gardner-Denver Mine Car Loaders are helping them to speed up the entire drilling-blasting-mucking cycle.

Mining engineers who have used the GD-9 know that the better performance of Gardner-Denver Loaders is the direct result of better design . . . that the famous Gardner-Denver fulcrum design assures more crowd—more speed at discharge. They know that the *two* equally powerful five-cylinder radial air motors provide the ability to crowd into the muck and come up with a full dipper of ore every bite.

With the men who count the most—with the men who bring out the ore—Gardner-Denver Loaders are mechanized "expediters" on the road to Victory.

For further information, write
Gardner-Denver Company, Quincy, Illinois

GARDNER-DENVER *Since 1859*

government guayule rubber project at Salinas, Calif. The work of the local foundry aided the rubber processing plant to get into production several months in advance of estimates. Government plans call for the planting of 500,000 acres in guayule and is expected to produce about 21,000 tons of rubber in two years, and after that an annual production of 80,000 tons. Plantations now in course of development involve large acreages in California, Texas, New Mexico and Arizona.

» » » Severe storms during December and January forced all producing mines in central and southern Idaho to temporarily suspend operations. At the Triumph mine, near Hailey, 150 men were thrown out of employment. The company's road equipment was unable to contend with six feet of snow blocking the road to the nearest railhead. The mine produces 13,000 tons of crude lead-silver-zinc ore per month.

» » » The Hecla Mining Company has declared its first quarterly dividend for the year 1943, amounting to 25 cents a share and totaling $250,000. This payment brings the total dividend record for Hecla to $26,155,000. Last year the company paid an even $1,000,000 and the year previous, $1,250,000. In wages and salaries the company pays out yearly approximately $974,000; for forest products bought within the state of Idaho, $143,137; for electric power, $99,000; for freight shipments, $72,000; payments to Idaho smelters for ore treatment, $581,000; for supplies, insurance, workmen's compensation and miscellaneous items, $482,000; for state taxes, $110,000; for Federal taxes, $177,000; total, $2,638,137.

» » » The Snowstorm copper mine, three miles east of Mullan, which from 1904 to 1914 shipped 795,786 tons of copper ore to the Anaconda smelter and declared dividends of $1,457,647, has been sold for delinquent taxes to Chas. E. Horning and John Seculic. The Snowstorm group consisted of 16 patented claims. The new owners have located nine claims adjoining the original group to the east, and formerly known as the Pandora.

» » » Eighteen Idaho roads totaling 352 miles in length and costing an estimated $759,530 have been certified for construction by the War Production Board, according to Raymond Briggs, district manager. Primary purpose of the work is to speed up production of vital war minerals from inaccessible parts of the state.

» » » Federal Mining & Smelting Company dividend for the first quarter of 1943 is $1 per share, or a total of $246,640, bringing the company's total dividend record to $28,761,040. The company paid its stockholders $986,560 in 1942, divided into four $1 dividends. Federal employs approximately 800 men in its Morning and Page mining and milling operations. The annual pay roll of the company amounts to around $2,070,000; mining and milling supplies amount to about $700,000 annually; electric power, $225,000; federal taxes, $600,000 and Idaho state and county taxes, $150,000.

Smelter of the Bunker Hill and Sullivan Mining and Concentrating Co., Idaho

» » » Sunshine Mining Company, owners of the largest silver producing mine in the United States, is paying its first quarterly dividend of 15 cents a share for the year 1943, totaling $223,323, and bringing the grand total paid to date to $22,749,187. Last year the company paid dividends totaling $818,851, or at the rate of 55 cents a share. Ore reserves ready for mining at the end of 1942 are estimated by R. D. Leisk, general manager, at 583,000 tons.

» » » Portland and Monitor Mining Companies, two new Day companies in the Beaver district, propose consolidation under the name of the Monitor Company. Under the suggested combine Monitor would issue one share of its unissued capital stock for four shares of the outstanding stock of the Portland Company. The meeting was held on March 23. Both companies have recently purchased large mineral holdings in the Beaver district of the Coeur d'Alenes. The Monitor Mining Company has started shipping zinc-lead ore from new properties in the Beaver district to the Dayrock mill, near Wallace. The first shipment was 100 tons, hauled out by truck over a new mine-to-market road constructed by the U. S. forestry department.

» » » The output of silver from Idaho, the largest silver-producing state, was 14,200,020 fine ounces of recoverable silver in 1942, a decrease of 2,472,390 ounces (15 per cent) from 1941. A 35 per cent decrease in production from the Sunshine mine (second largest silver producer in the United States) and a decrease from the Morning and Polaris mines account largely for the state decrease. Following the Sunshine, other large producers of silver in Idaho in 1942 were the Mineral Point (Coeur d'Alene Mines Corporation), Bunker Hill & Sullivan, Hecla, Polaris, Morning, Triumph, Page, Sherman, Star, De Lamar Milling Corporation, and Tamarack & Custer mines, all in the Coeur d'Alene region except the Triumph (near Hailey) and the De Lamar Milling Corporation (at De Lamar). About 51 per cent of the silver produced in the state in 1942 was from silver ore and the remainder largely from zinc-lead ore.

MONTANA

» » » Governor Ford, of Montana, protests the 2-lb.-per-week meat ration for Montana workers, declaring the amount insufficient for manual laborers.

It is reported that he has written OPA Administrator Prentiss M. Brown as follows:

"The order limiting all civilians to 2 lb. of meat weekly will have an extremely detrimental effect in this state.

"It should be readily understood that men working hundreds of feet underground in the mines, or cutting lumber in our forests and mills, or punching cattle and herding sheep on our ranges, or helping on the farms and ranches to produce food for victory, must have a diet sufficient to sustain them in the exacting work they are doing.

"These men, and women as well, are toiling long hours and their work is fatiguing. Two pounds of meat per person per week is not going to permit them to keep up this pace. The 2-pound-per-week order is sufficient for an office worker and those not engaged in manual labor, but I submit

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Day by day, a lot of money is being saved in both time and vital equipment by repair welding with Anaconda Rods such as Tobin Bronze* and "997" Low Fuming. The availability of this fast, efficient method of repair gives war industries a potent aid in keeping up production. For information on welding with Tobin Bronze and 15 other Anaconda Rods, write us for Publication B-13. You'll find it especially useful at this time when prolonged equipment life is so important. 4385

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Anaconda Welding Rods

ANACONDA

that it is unfair to limit workingmen's diets to such an extent and then expect them to work as hard and as long as before."

» » » A Bureau of Mines proposal to erect a 400-ton-a-day custom mill at Butte, Mont., to treat manganese ores produced by several mines in that area and thus provide more manganese for the nation's steel mills, has been approved by the Facility Review Committee of the War Production Board, it was revealed late in March. The Domestic Manganese Company, prominent in the manganese field of Montana, has applied for a $250,000 loan from the Reconstruction Finance Corporation to construct the mill. The company proposes to utilize old milling equipment in the Butte area for the plant and to resume operation of its modern nodulizing plant at Butte to produce ferrograde manganese nodules. About 12 lb. of manganese are required for every ton of steel produced.

Carrying the proposal to WPB, the Bureau pointed out that in formulating the project its exploratory crews had drilled more than 10,000 ft. of test holes, had taken hundreds of ore samples, and had tested the contemplated milling method. The Bureau research revealed that the carbonate manganese ore in four active mines in the Butte-Phillipsburg area average 23 percent manganese. When milled and nodulized, the ore averages from 51 to 59 percent manganese.

Under the contemplated program, the ore delivered to the mill would be purchased by the Metals Reserve Company which has been buying ore for stock-piling in the Butte-Philipsburg region. The Domestic Manganese Company proposes to mill and nodulize the stockpiled ore along with the newer ore produced by the mines.

The Bureau of Mines reported that the construction of the milling plant is particularly desirable because of the availability of large quantities of idle equipment in the Butte area. A survey showed that only a small amount of new machinery will be necessary and that most of the plant can be constructed from equipment formerly used in a load-zinc mill near Butte.

Long a producer of battery-grade oxide manganese ore, the Philipsburg area lies about 60 miles west of Butte. Two of the mines which would be served by the new mill are at Philipsburg and two are at Butte. The Domestic Manganese Company contemplates reopening a fifth mine at Butte to serve the mill so that the flow of raw materials would remain virtually constant.

Company officials informed the Bureau that the milling plant could be constructed in about 90 days and that its rated capacity of 400 tons a day would be ample to handle presently producing mines and to accommodate smaller operations which might enter the field because of available milling facilities.

Montana holds the leading position in the United States as the domestic producer of manganese, and the Butte-Philipsburg area is responsible for most of the ore mined in that state, according to the Bureau of Mines. The four mines to be served by the proposed mill have a combined daily output of about 260 tons, but production would increase if the mill is built.

» » » Deposits of talc, known for many years to exist south of Ennis, Mont., are being developed under lease by L. F. Teutsch, as a result of the present war. The property is known as the Mountain Talc Mines, in Johnny Gulch. The types of talc produced are ceramic steatite and lava grade talc.

WASHINGTON

» » » Deposits of scheelite (calcium tungstate) on the property of the Copper Mining Co., in the Bumping Lake district, Yakima County, Wash., were examined in September, 1942, by S. Warren Hobbs of the Geological Survey, United States Department of the Interior, in the course of the survey's investigation of domestic sources of strategic minerals. A map of the lower tunnels and a surface map of the principal vein zone were prepared by Mr. Hobbs to accompany his brief report.

Manufacturers Forum

A Steel-Saving Screw Conveyor Trough

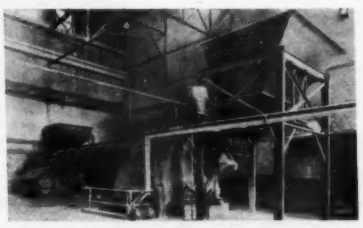
Link-Belt Company, 2410 West 18th Street, Chicago, announces that they have developed a screw conveyor trough that is made of a combination of steel trough bottom, wooden sides and wooden cover board, lag-screwed together to form a complete, tight enclosure for the screw and the material it conveys. A substantial percentage of steel is saved compared to the all-steed trough and cover plate heretofore furnished.

The new combination wood and steel trough is adapted to all standard screw conveyor fittings; will readily connect with existing steel trough; and can be shipped with sides and bottom assembled.

The curved bottom will be made of steel no heavier than No. 10 gauge, and has the added advantage of being removable by unscrewing of the lag screws securing it to wooden trough sides, thus facilitating cleaning and replacement.

Drying Fine Mesh Materials

A new rotary dryer has been introduced by L. R. Christie Company, 17 E. 42nd Street, New York, which is said to eliminate the need for independent dust collectors, heretofore usually found necessary in drying fine



mesh materials. It is of a type known as an indirect dryer, in which the furnaces gases do not come in direct contact with material to be dried.

It consists of a metal drum divided into compartments in order to give increased heating surface, which is enclosed in an insulated steel casing that utilizes the entire surface of the outer shell for additional heating surface. It may also be used as a rotary retort and distilled gases recovered, or drying done in an inert atmosphere. All openings, it is said, are closed against infiltration of air but at the same time, by patented construction, the operation of charging and discharging are continuous.

Due to the total absence of draft in, over and around the "charge," the dryer handles materials of —300 mesh without appreciable dust loss.

Any nature of fuel or heating medium can be used and efficiencies obtained better than 60 percent. Recirculation of furnace gases give easy control of temperatures and improved efficiency.

Lightweight Linestarter

Requiring less than half the mounting area of former units without sacrificing wiring space, and saving considerable critical materials, a compact lightweight linestarter has been developed by Westinghouse engineers which is under 10 in. high. E. G.

Forgy shows the new space-saving unit to L. F. A. Mitchell, T. C. Kelley and R. W. Owens (left to right) all of East Pittsburgh. Although overall dimensions are smaller compared with former unit (shown at right) all parts are accessible from the front for easy repair and maintenance.

New Portable Electric Drill

First public announcement of a new Thor plastic ¼-in. portable electric drill has just been made by Independent Pneumatic Tool Company of Chicago, after nearly a year in which large quantities of the drill

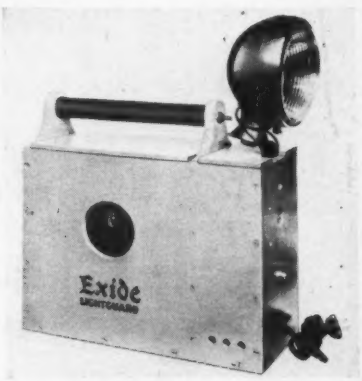
have been produced under Army contract.

The grip handle, field case and gear case of the drill are constructed of a new, tough, light weight "Thorite" plastic developed exclusively for Thor. Developed last May in Thor laboratories, the plastic-encased drill underwent vigorous tests and is now in use by the Army all over the world.

Emergency Lighting Unit

Requiring no fixtures or wiring other than plug-in connections to the A.C. supply, the new Exide Lightguard Emergency Lighting Unit for war-time service is announced by The Electric Storage Battery Company, Philadelphia.

It has been designed to meet the need for a source of emergency light in war industries and other places



where war-time activity has increased the potential dangers resulting from power-line failure, fires, and sabotage. It throws a beam of light 50 ft. wide a distance of 150 to 200 ft., covering an area of 7,500 sq. ft.

Because it is a self-contained unit weighing only 47 pounds, it can easily be moved from its customary position during a fire, accident, explosion or air-raid, for use in rescue work.

The new unit operates instantly and automatically without a hand touching a switch. The only maintenance required is the occasional adding of water. Recharging is done automatically by trickle charge. State of charge is clearly indicated by pilot balls.

The unit measures overall 16½ in. long by 6¼ in. wide by 18 in. high. The battery is a long-lived 3-cell Exide, type KZHGR-7, with thick plates assembled in a glass jar.

INDEX TO ADVERTISERS

American Brass Co., The 65
American Chain & Cable Co., Inc. ..... Third Cover
American Cable Division
Cleveland Rock Drill Co., The 14
Climax Molybdenum Co. 55
Cummins Engine Co. 16
Denver Equipment Co. 2
Gardner-Denver Co. 63
General Electric Co. 6-7
Goodman Mfg. Co. 3
Hercules Powder Co. 9
Hoffman Bros. Drilling Co. 68
Ingersoll-Rand 12
I-T-E Circuit Breaker Co. 58
Johnson-March Corp., The 54
Joy Mfg. Co. 34-35
Link-Belt Co. 4
Loftus, Peter F. 56
Macwhyte Co. 60
Marion Steam Shovel Co., The 15
Mott Core Drilling Co. 68
Myers-Whaley Co. 42
Ohio Brass Co. 5
Paris Mfg. Co. 62
Pennsylvania Drilling Co. 68
Philco Corp. ..... Back Cover
Storage Battery Division
Roberts & Schaefer Co. 57
Robinson Ventilating Co. 68
Sanford-Day Iron Works ..... Second Cover
Simplicity Engineering Co. 58
Sullivan Machinery Co. 10-11
Tamping Bag Co., The 66
Templeton, Kenly Co. 58
Timken Roller Bearing Co., The 8
Universal Vibrating Screen Co. 68
United States Rubber Co. 13
Young, L. E. 56

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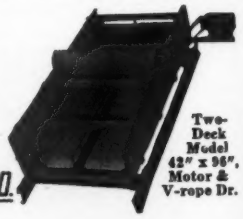
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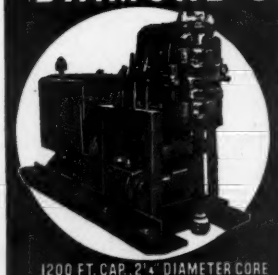
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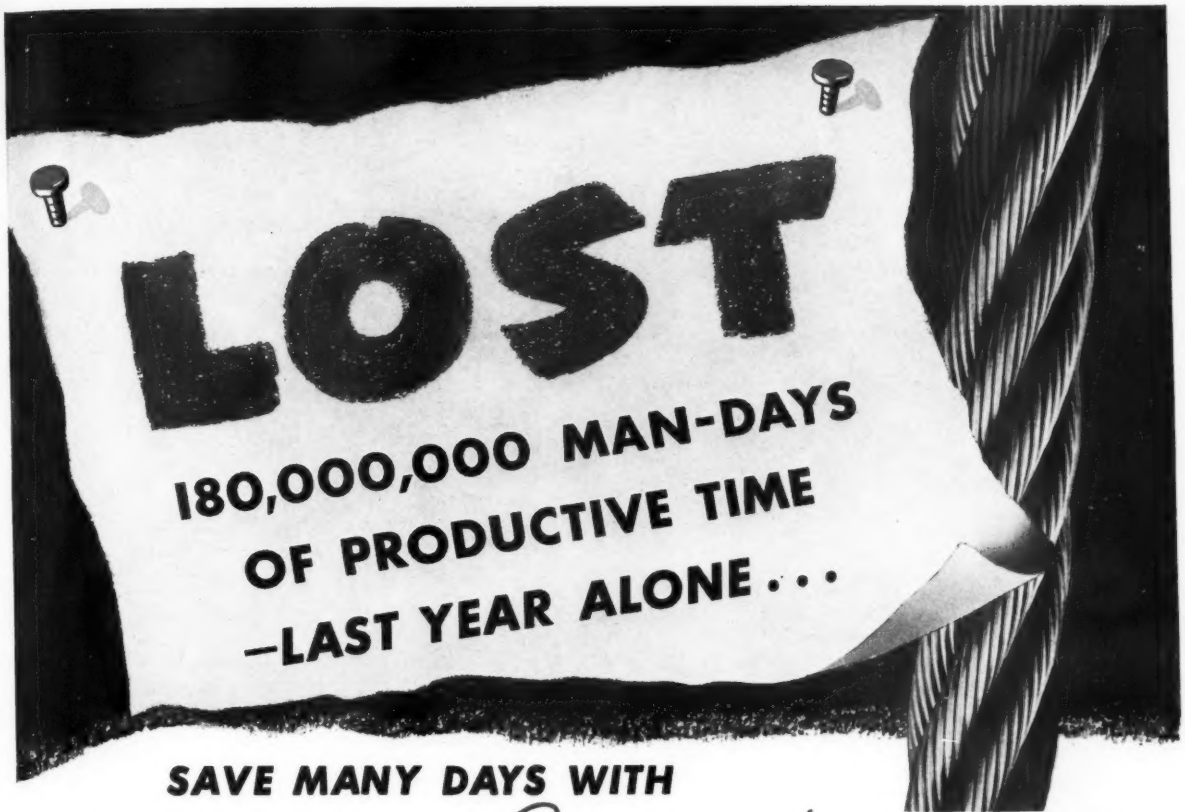

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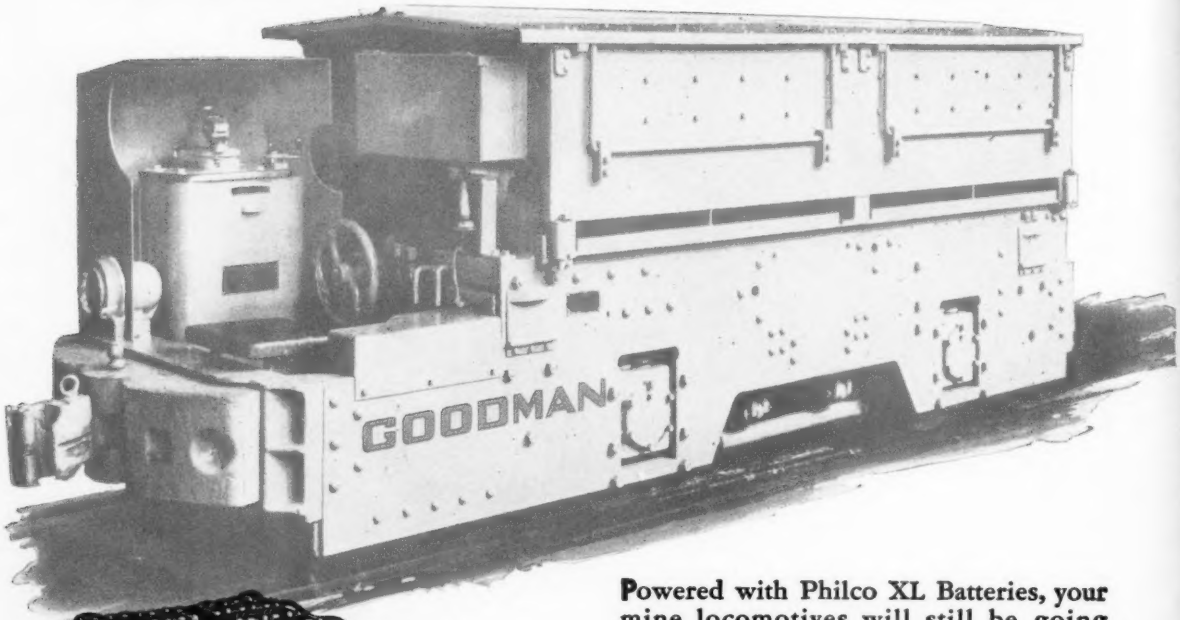

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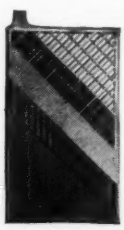
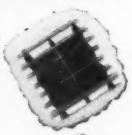
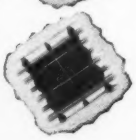


(*Upper right*) Philco "K" Process produces a flint-hard, porous plate.

(*Lower right*) Ordinary plate drying.



(*Left*) Philco Triple Insulation—Glass Fibre Mats, Slotted Rubber Retainers, rugged Philco Separators.



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